ORDER NO. KM49606048A1
F1

Service Manual

and Technical Guide

Telephone Equipment

KX-T4169C-B

(for Canada)

Simplified

SOUND CHARGER PLUS

Cordless Phone

Please use this manual with the original Service Manual for model KX-T4168C-B order No. KM49512015C1.
This Service Manual indicates the main differences between: Original KX-T4168C-B and KX-T4169C-B.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians.
Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

■ PARTS COMPARISON TABLE (Change from original pages 66~75)

Ref. No.	Part No.		Part Names & Descriptions	Pcs/ Set	Note
	KX-T4168C-B	**KX-T4169C-B**			
Base Unit					
12	PQGT12117Z	-------	Name Plate	0	Deletion
PCB1	PQWP1T4168CH	**PQWP1T4169CH**	Main, P.C.Board Ass'y (RTL)	1	
D31	1SS120	-------	Diode (Si)	0	Deletion
R 4	ERJ3GEYJ104	**ERJ3GEYJ124**	Resistor, 120kΩ	1	
R40	ERJ3GEYJ224	**ERJ3GEYJ394**	Resistor, 390kΩ	1	
R903	ERJ3GEYJ394	**ERJ3GEYJ103**	Resistor, 10kΩ	1	
C35	ECEA1HKSR47	**ECEA1HKSR22**	Capacitor, 0.22μF	1	
C900	ECUV1H104ZFV	**ECUV1H473MDV**	Capacitor, 0.047μF	1	
Portable Handset					
111	PQGT12208Z	-------	Name Plate	0	Deletion
PCB100	PQWPT4168CR	**PQWPT4169CR**	Main, P.C.Board Ass'y (RTL)	1	
IC5	PQVI401714FU	**PQVI401733FU**	IC	1	
D252	——	**MA110**	Diode (Si)	1	Addition
Accessories and Packing Material					
A 3	PQQW11430Z	**PQQW11646Z**	Quick Reference Guide (English)	1	
A 4	PQQW11600Z	**PQQW11647Z**	Quick Reference Guide (French)	1	
A 5	PQQX11468Z	**PQQX11624Z**	Instruction Book (English)	1	
A 6	PQQX11469Z	**PQQX11625Z**	Instruction Book (French)	1	
P 4	PQPK11834Z	**PQPK12120Z**	Gift Box	1	

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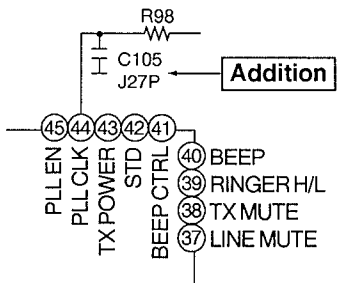
KX-T4169C-B

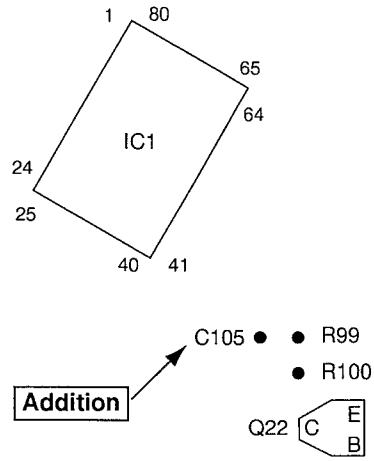
■ SCHEMATIC DIAGRAM [KX-T4168CH-B] (Change from original pages 19 and 20)



(Model KX-T4169C-B)

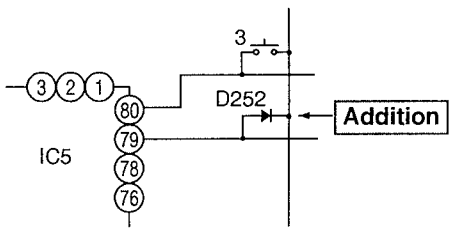
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM [KX-T4168CH-B] (Change from original pages 21 and 22)

(Flow Solder Side View)



(Model KX-T4169C-B)

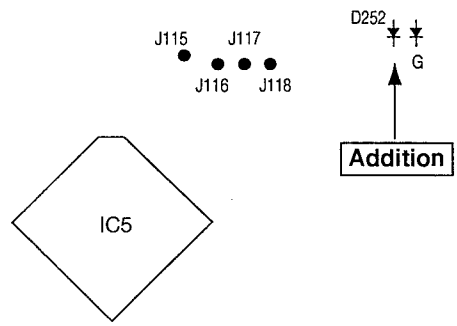
■ SCHEMATIC DIAGRAM [KX-T4168CR-B] (Change from original pages 29 and 30)



(Model KX-T4169C-B)

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM [KX-T4168CR-B] (Change from original pages 27 and 28)

(Flow Solder Side View)



(Model KX-T4169C-B)

Y (Q) KXT4169CB-AK
Printed in Japan

ORDER NO. KM49512015C1
F1

Service Manual

and Technical Guide

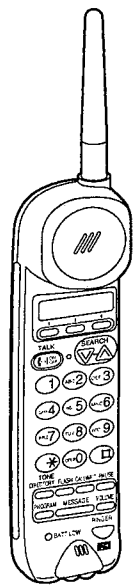
SOUND CHARGER PLUS

Cordless Phone

Telephone Equipment

KX-T4168C-B

(for Canada)



(KX-T4168CR-B)

(KX-T4168CH-B)

■ SPECIFICATIONS

General

Modulation:	FM, 5 kHz Deviation	Pause:	3.5 seconds per pause
Frequency Stability:	±2.5 kHz	Memory Capacity:	30 names and phone numbers, up to 16 digits in the direction
Dial Type:	Tone (DTMF)/Pulse		
Redial:	Last dialed number each time the Redial button is pressed		

	Base Unit (KX-T4168CH-B)	Portable Handset (KX-T4168CR-B)
Power Source:	AC adaptor KX-A11-6 (DC 12 V)	Built-in rechargeable Ni-Cd battery (PQXA36ASVC)
(Receiver Section)		
Receiving Frequency:	10 channels within 49.6 to 49.9 MHz	10 channels within 46.6 to 46.9 MHz
Adjacent Channel Rejection:	40 dB	40 dB
Sensitivity:	1dBμV for 20 dB S/N	2 dBμV for 20 dB S/N
(Transmitter Section)		
Transmitting Frequency:	10 channels within 46.6 to 46.9 MHz	10 channels within 49.6 to 49.9 MHz
Jacks:	DC IN, Telephone line	
Antenna:	Telescopic	Rubber Flexible
Speaker:	2" (5 cm) PM dynamic	$1^{3}/_{16}$" (3 cm) dynamic
Microphone:	Condenser microphone	Condenser microphone
Dimensions (H×W×D):	$1^{9}/_{16}$"×5 $^{1}/_{2}$"×$8^{21}/_{32}$" (40×140×220 mm)	$11^{1}/_{16}$"×2"×$1^{15}/_{16}$" (281×51×49 mm)
Weight:	1lb 3.4oz. (550 g)	7.76 oz. (220g) with battery

Design and specifications are subject to change without notice.

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When you mention the serial number, write down all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When repairing, the following precautions will help prevent recurring malfunctions.
1. Cover plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on worktable.
4. Do not grasp IC or LSI pins with bare fingers.

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LOCATION OF CONTROLS

Portable Handset (KX-T4168CR-B)

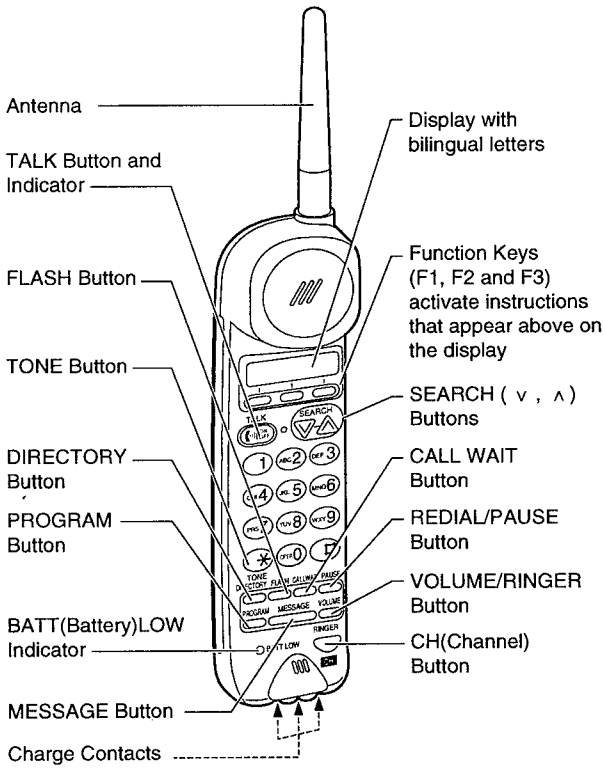


Fig.1

Base Unit (KX-T4168CH-B)

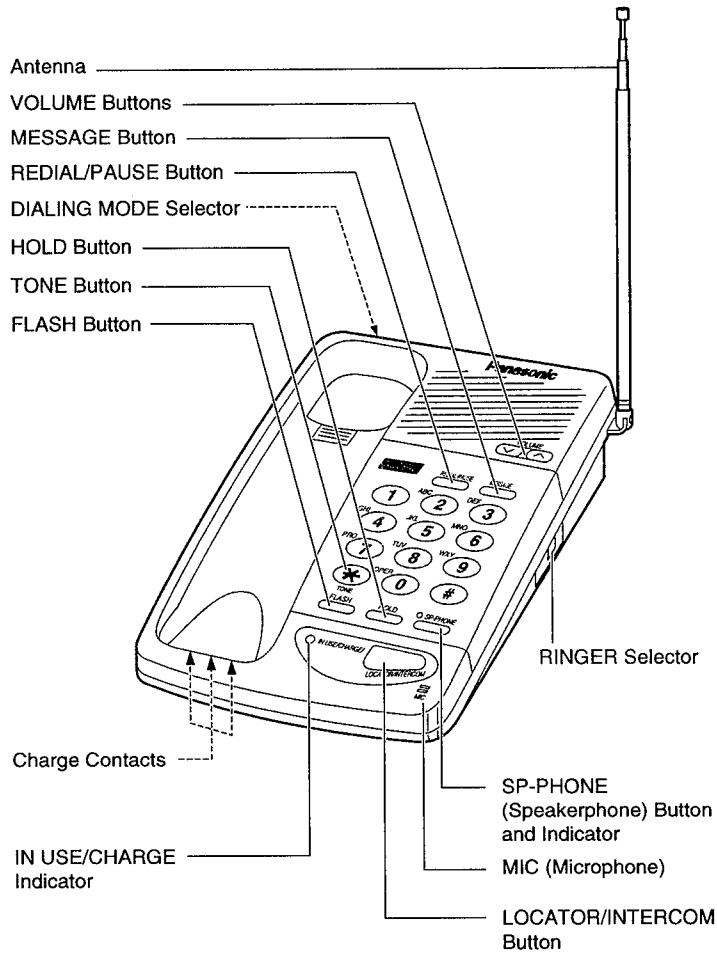


Fig.2

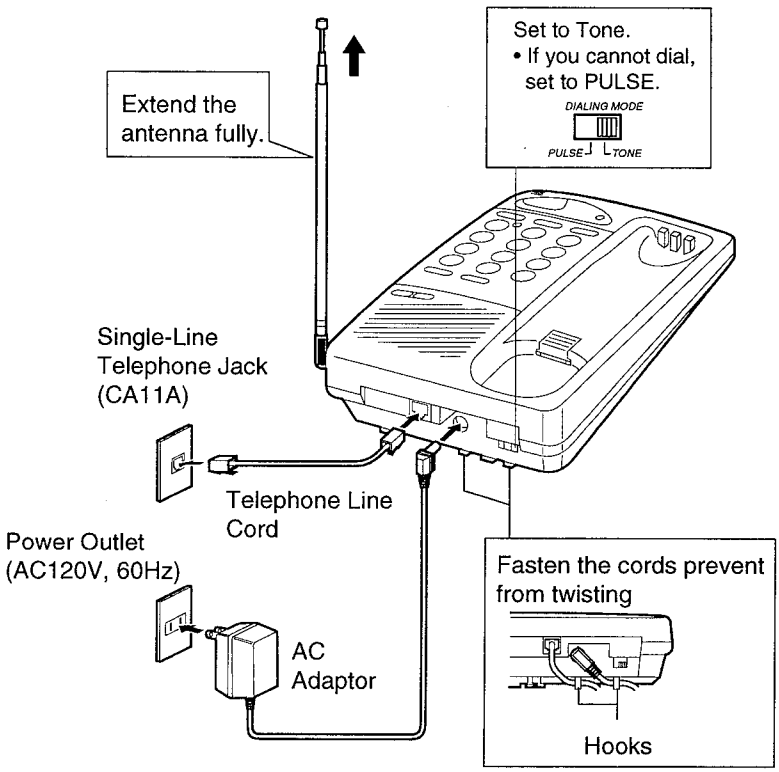
STANDARD BATTERY LIFE

If your Panasonic battery is fully charged;

While in use (TALK)	Up to about 8 hours
While not in use (Stand-by)	Up to about 14 days

- Battery life may vary depending on usage conditions and ambient temperature.
- Clean the charge contacts with a soft cloth once a month, or the battery may not charge properly.
- Once the battery is fully charged, you do not have to place the handset on the base unit until the BATT LOW/PROG indicator flashes.
- The battery cannot be overcharged.

CONNECTION



This connection is for Canada version only.

Refer to the simplified manual (cover) for U.S.A. or other areas.

- USE ONLY Panasonic AC ADAPTOR KX-A11-6.
- The AC adaptor must remain connected at all times.

Fig.3

BATTERY STRENGTH

You can check the present battery strength while the handset is in the battery saver or stand-by mode.

Press (F1) (BATT Key).
— If the display is blank, press one of the function keys to turn the display on.

The display shows the present battery strength as shown in the chart below.

Display prompt	Battery strength
[■■■]	Fully charged
[■■]	Medium
[■]	Low

DISPLAY

The handset gives you instructions and information on the display. In the battery saver mode, the display is blank until you use the handset.

12 NEW CALLERS BATT INTERCOM	The display shows the number of new callers in the stand-by mode. To check the battery strength, press **F1** (BATT key). To page the base unit, press **F3** (INTERCOM key).
1112222 01-06-35 INT	During a conversation, the display counts the call duration. (Ex: 1 hour, 6 minutes 35 seconds.)
OUT OF RANGE	The handset has lost communication with the base unit.
BATTERY [▮]	When you press **F1** (BATT key), the display shows the present battery strength. (Ex: The battery strength is low.)
INTERCOM CH9 00-00-06 OFF	The handset and the base unit enter the intercom mode . To end the intercom, press **F3** (OFF key).
HOLD 00-02-14 INT	An outside call is put on hold by the handset user. To release the hold, press **TALK** or **SP-PHONE** .
SUSAN HAMMER DIAL CLEAR No.	This is a name from the Caller List information. Use the function keys as you need.
021-111-??22 DIAL EDIT DATE	The received caller's phone number has an error (?).
OUT OF AREA	The caller dialed from an area which does not provide the Call Display service.
LONG DISTANCE	When a long distance call cannot be identified.
PRIVATE CALLER	The caller has requested not to deliver their information.
END OF NEW CALL EXIT	You finished viewing the NEW CALLS in the Caller List. To exit, press **F3** (EXIT key).
END EXIT	At the end of the Caller List when you are pressing **SEARCH** (v, ∧). To exit, press **F3** (EXIT key).
NO CALLERS EXIT	The Caller List is empty. To exit, press **F3** (EXIT key).
ANNE DIAL NO.	This is a name from the directory item. Use the function keys as you need.
NO ITEM STORED	There's no stored item at a dialing button you pressed in the directory.
MEMORY IS FULL CLEAR EXIT	During a storing procedure, the display shows the directory memory is full.
SAVE ERROR	During a programming procedure, the handset has lost communication with the base unit. Move closer to the base unit.
----WAITING----	During a conversation, the display informs you have received a second call.

OPERATIONS

NEW OPERATIONS

USING THE DIRECTORY

You can store up to 30 names and phone numbers in the directory. All directory items are sorted by the first word in alphabetical order.
You can enter a first or last name. Using the directory, you can make a call by selecting a name on the display. If you don't enter a name, the item is sorted by number.

Storing Names and Numbers in the Directory

You can store a name and number while the handset is in the battery saver or stand-by mode.

1 Press **PROGRAM**.

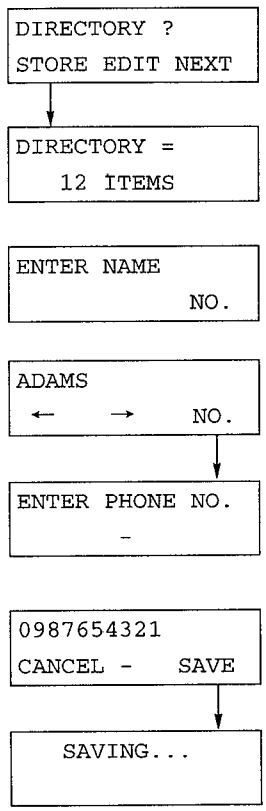
2 Press **F1** (STORE key).
— The display shows the number of stored items in the directory.

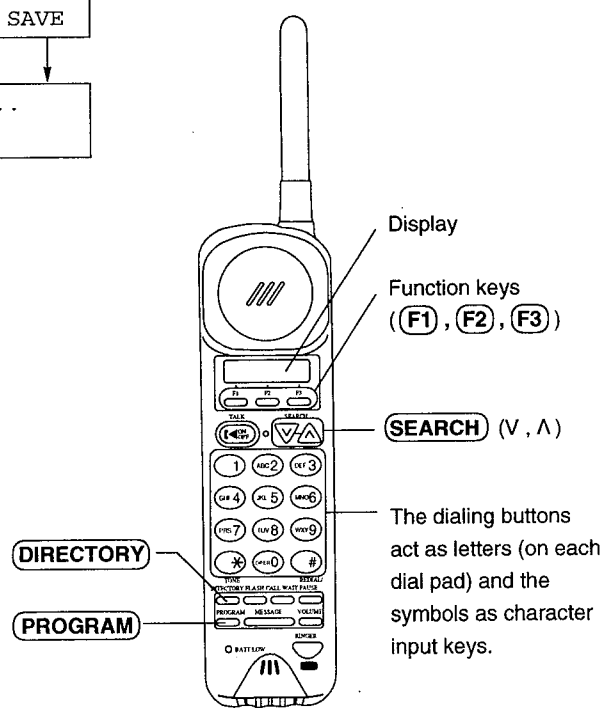
3 Enter a name up to 15 characters with the dialing buttons, **F1**(←) and **F2**(→).
— See the Steps for entering names and symbols.

4 When finished, press **F3** (NO. key).

5 Enter a phone number up to 16 digits.
— If you enter a wrong number, press **F1** (CANCEL key), then enter the correct number.
— You can enter a hyphen by pressing **F2**. A hyphen counts as one digit.

6 When finished, press **F3** (SAVE key).
— The item is saved and the display shows "SAVED OK".

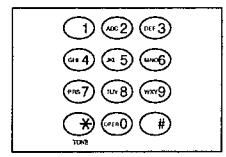



Display
Function keys
(F1, F2, F3)
SEARCH (V, Λ)
The dialing buttons act as letters (on each dial pad) and the symbols as character input keys.
DIRECTORY
PROGRAM

Notes:
— To cancel the programming halfway, press **PROGRAM**. Then restart from step 1.
— If the display shows "MEMORY IS FULL" in step 2, press **F1** (CLEAR key) to erase other stored item from the directory.
— If you want to store only a phone number, skip over step 3, then continue with step 4.
— If the display shows "SAVE ERROR", move closer to the base unit and try again. If "SAVE ERROR" still remains, place the handset on the base unit. Then reprogram from step 1.
— Data retention time during power failure is approximately 1 day.

Steps for Entering Names and Symbols

The dialing buttons can be used as letters and symbols as character input keys.
Pressing each button alternately selects a character as shown below.



	Number of pressing times								
Keys	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	&	'	(	)	,	-	.	/	1
2	A	B	C	a	b	c	2		
3	D	E	F	d	e	f	3		
4	G	H	I	g	h	i	4		
5	J	K	L	j	k	l	5		
6	M	N	O	m	n	o	6		
7	P	Q	R	S	p	q	r	s	7
8	T	U	V	t	u	v	8		
9	W	X	Y	Z	w	x	y	z	9
0	0	Blank							
*	*								
#	#								

For example, enter "Tom Jones":

During entering names, the underlined part will flash on the display.

1 Press 8.

```
T
←    →    NO.
```

2 Press 6 six times, then press F2 (→) to move the cursor to the right.

```
To_
←    →    NO.
```

3 Press 6 four times.

```
Tom
←    →    NO.
```

4 Press F2 (→) twice to enter a blank.

```
Tom _
←    →    NO.
```

5 Press 5.

```
Tom J
←    →    NO.
```

6 Press 6 six times, then press F2 (→) to move the cursor to the right.

```
Tom Jo_
←    →    NO.
```

7 Press 6 five times.

```
Tom Jon
←    →    NO.
```

8 Press 3 five times.

```
Tom Jone
←    →    NO.
```

9 Press 7 eight times.

```
Tom Jones
←    →    NO.
```

Note:

— If you make a mistake while entering names, use F1 (←) or F2 (→) to move the cursor to the incorrect character, then make the correction.
You can delete one digit by pressing 0 twice to enter a blank.

Finding Items in the Directory

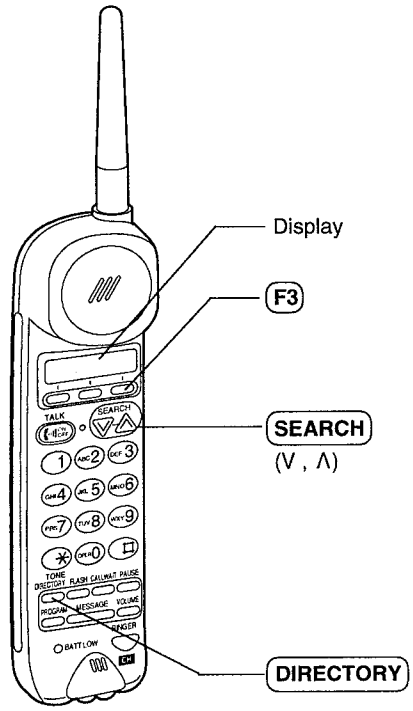
1 Press (DIRECTORY).

2 Press the dialing button of the first letter of the desired name repeatedly.

Ex. To find Frank, press (3) repeatedly until the first item under "F" is displayed.

3 Press (SEARCH) (v or ∧) to move up and down between items.
Press (F3) to move between name and number.

4 To leave the directory at any time, press (DIRECTORY).



Note:
— The item without name information is sorted by number.

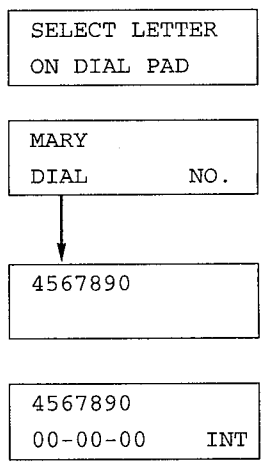
Keys	Index	Keys	Index
1	1, other symbols	7	P, Q, R, S, 7
2	A, B, C, 2	8	T, U, V, 8
3	D, E, F, 3	9	W, X, Y, Z, 9
4	G, H, I, 4	0	0
5	J, K, L, 5	*	*
6	M, N, O, 6	#	#

Dialing from the Directory

1 Press (DIRECTORY).

2 Find the directory item that you want to dial.

3 Press (F1) (DIAL key).
— The unit obtains a dial tone and automatically dials the number.



Changing an Item in the Directory

1 Press **PROGRAM**.

2 Press **F2** (EDIT key).

3 Find the directory item you want to change.
Ex: "Jane" is changed.

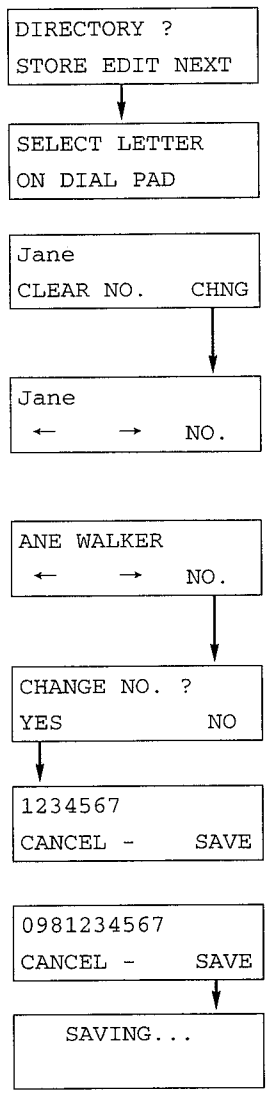
4 **a) If you need to change the name**, press **F3** (CHNG key) and change the name with the dialing buttons, **F1** (←) and **F2** (→).
b) If you don't need to change the name, press **F2** (NO. key), then **F3** (CHNG key) and skip to step 7.

5 When finished, press **F3** (NO. key).

6 Press **F1** (YES key).
—If you don't need to change the number, press **F3** (NO key) and programming is complete. The display shows "SAVED OK".

7 Enter the new number up to 16 digits.

8 When finished, press **F3** (SAVE key).
—The changed item is saved and the display shows "SAVED OK".



Notes:
— To cancel the programming halfway, press **PROGRAM**. Then restart from step 1.
— If the display shows "SAVE ERROR", move closer to the base unit and try again. If "SAVE ERROR" still remains, place the handset on the base unit. Then reprogram from step 1.

Erasing an Item from the Directory

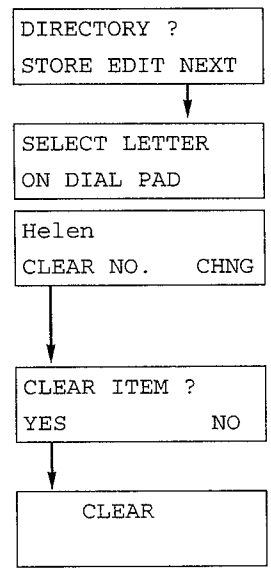
1 Press **PROGRAM**.

2 Press **F2** (EDIT key).

3 Find the directory item you want to erase.
Ex: "Helen" is erased.

4 Press **F1** (CLEAR key).

5 Press **F1** (YES key).
—The item is erased and the display shows "CLEAR".
—To cancel, press **F3** (NO key).



Note:
— To cancel the programming halfway, press **PROGRAM**. Then restart from step 1.

DISASSEMBLY INSTRUCTIONS

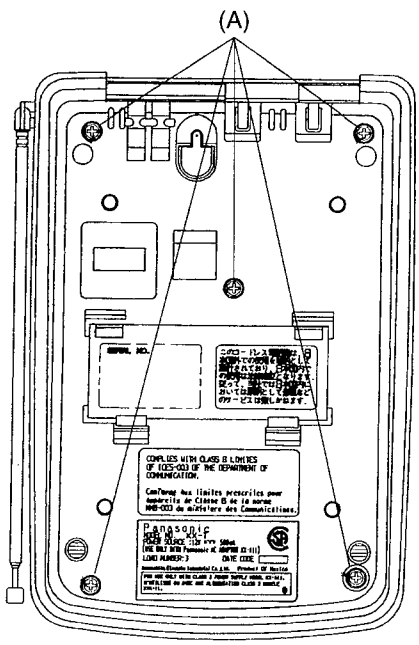


Fig. 4

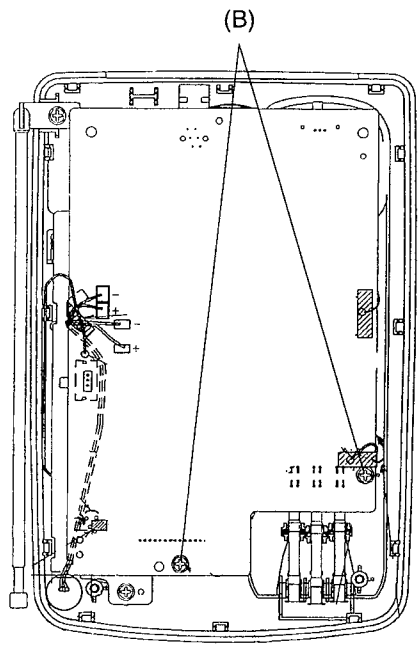


Fig. 5

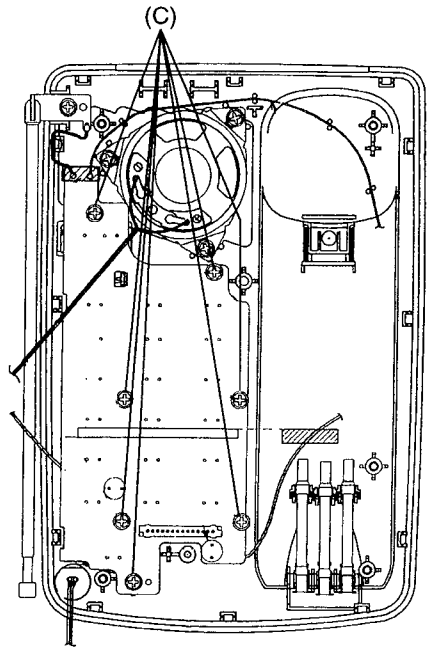


Fig. 6

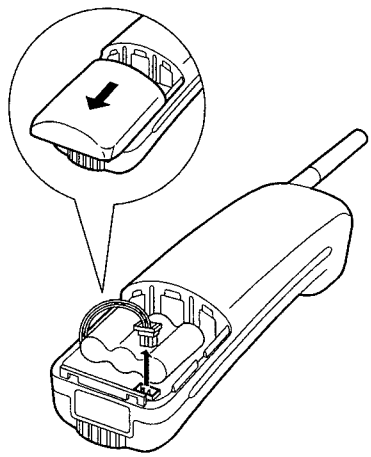


Fig. 7

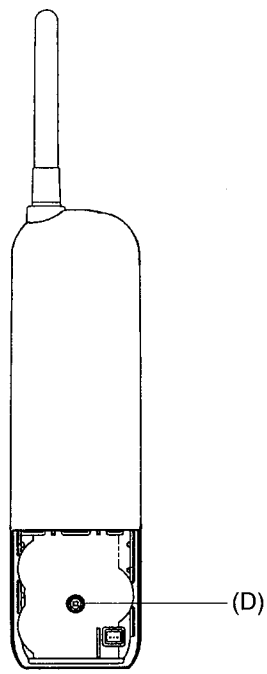


Fig. 8

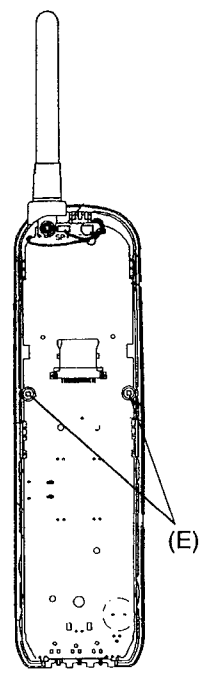


Fig. 9

Ref. No.	Procedure	Shown in Fig.—	To remove—.	Remove—.
1	1	4	Lower Cabinet	Screws (3×14)..... (A)×5
2	1, 2	5	Main Printed Circuit Board	Screws (3×10)..... (B)×2
3	1, 2, 3	6	Operation Printed Circuit Board	Screws (3×10)..... (C)×7
4	4, 5	7	Rear Cabinet	Remove the battery compartment cover
5		8		Screw (2.6×12)..... (D)×1
6	4~6	9	Printed Circuit Board	Screw (2.6×8)..... (E)×2

HOW TO REPLACE FLAT PACKAGE IC

■ PREPARATION

· SOLDER - - - - - - - - Sparkle Solder 115A-1, 115B-1
OR
Almit Solder KR-19, KR-19RMA

· Soldering iron - - - - - Recommended power consumption will be between 30 W to 40 W.
Temperature of Copper Rod 662 ± 50 °F (350 ±10℃)

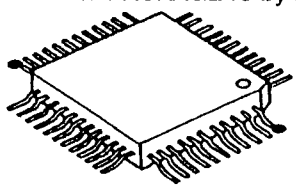
(An expert may handle 60~80 W iron, but beginner might damage foil by overheating.)

· Flux - - - - - - - - - - - HI115 Specific gravity 0.863

(Original flux will be replaced daily.)

■ PROCEDURE

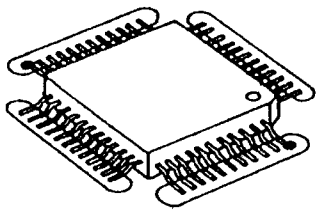
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.

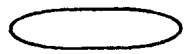


●- - - - - -Temporary soldering point.

*Most important matter is accurate setting of IC to the corresponding soldering foil.

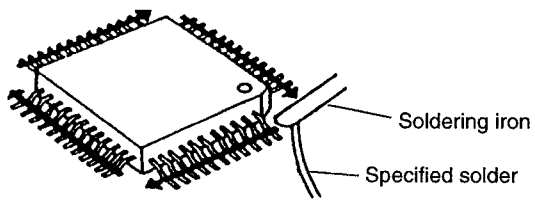
2. Apply flux for all pins of FLAT PACKAGE IC.





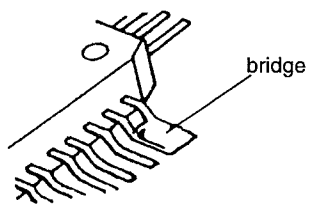
- - - - - Flux

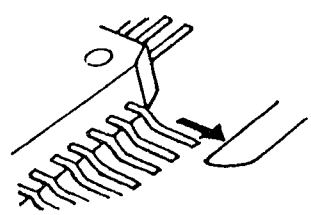
3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.



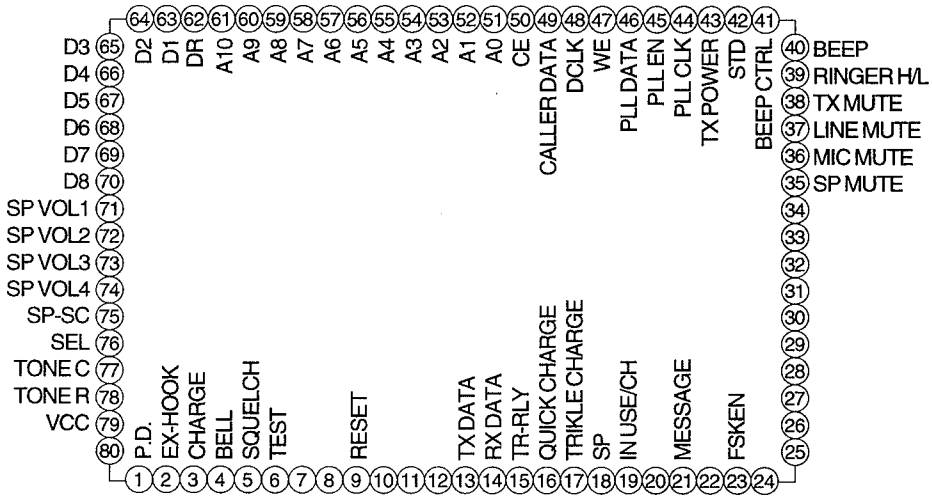
■ MODIFICATION PROCEDURE OF BRIDGE

1. Re-solder slightly on bridged portion.
2. Remove remained solder along pins employing soldering iron as shown in below figure.





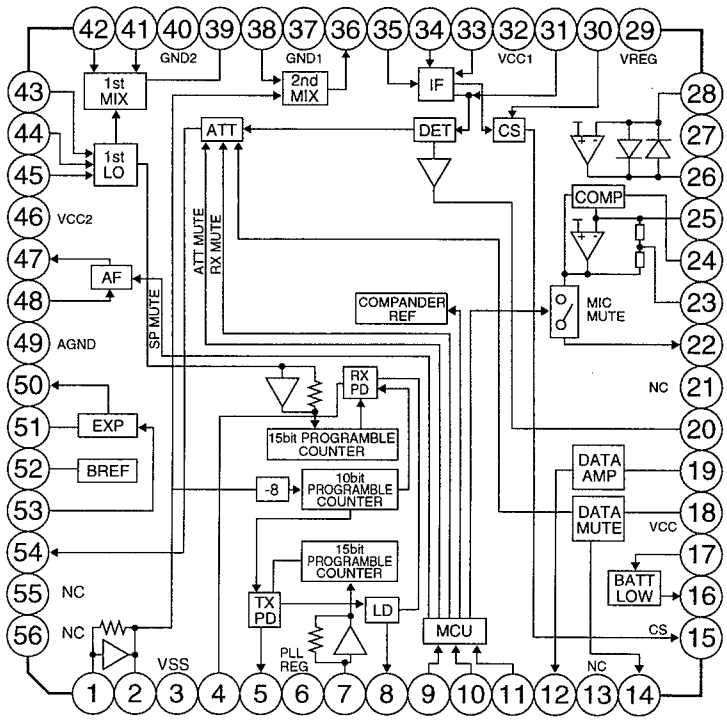
CPU DATA (KX-T4168CH-B)



IC1: PQVI4639RA29

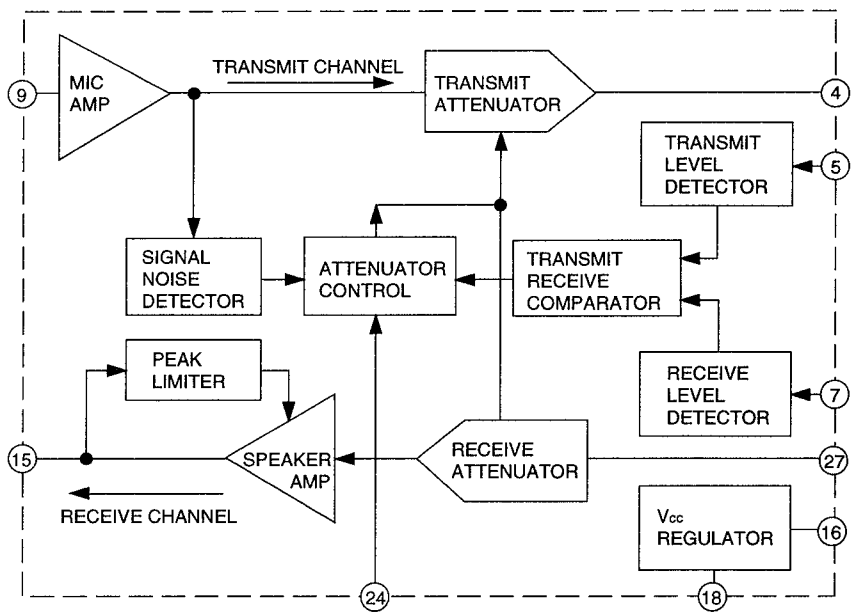
Pin No.	Description	I/O	High	High-Z	Low	Pin No.	Description	I/O	High	High-Z	Low
1	Power Down	I	Normal		Power Down	36	MIC Mute	O	Mute		Unmute
2	EX-Hook	I	Off Hook		On Hook	37	Line Mute	O	Mute		Unmute
3	Charge	I	Charge		Non	38	TX Mute	O	Mute		Unmute
4	Bell	I	Normal		Bell in	39	Ringer Control	O		High or Non	Low or Non
5	SQUELCH	I	Weak Electric Field		Strong Electric Field	40	Beep Clock	O	(Active)		(Active)
6	Test Pin					41	Beep Control	O		High or Non	Low or Non
7	CPU Clock	I				42	StD	O	O		X
8	(8MHz)					43	TX Power	O	ON		Off
9	Reset inputting	I	Reset		Normal	44	Clock Control	O			
10	Not Used					45	PLL EN	O	Active		Normal
11	Not Used					46	PLL Data	O		Off	On
12	GND				GND	47	SRAM WE	O	Read		Write
13	TX Data	O				48	Caller Clock	I			
14	RX Data	I				49	Caller Data	I	Mark		Space
15	TR-RLY	O	Break		Make	50	SRAM CE	O	Normal		Active
16	Quick Charge	O	Quick		Normal	51~61	SRAM Adress	O	"1"		"0"
17	Trickle Charge	O	Normal		Trickle		A0~A10				
18	SP-Phone LED	O		Off	On	62	DR	I	Normal		Data
19	IN USE LED	O		Off	On	63~70	SRAM Data	I/O	"1"		"0"
20	Modem Power	O	Power		Power Off		O1~O8				
21	Message LED	O		Off	On	71~74	Electrical Volume1~4	O			
22	DTMF LEV					75	SP-Phone CS	O	Off		On
23	FSK EN	O	Enable		Disable	76	SEL		(High)		(Low)
24~26	SW/Potion in	I	Normal		SW in	77	TONE C	O			
27~30	Key in	I	Normal		Key in	78	TONE R	O			
31~34	Key Strobe	O	Normal		Active	79	Power Supply				
35	SP Mute	O	Mute		Unmute	80	Output Level of DTMF				

EXPLANATION OF IC TERMINALS



IC2. AN6185NFA

Pin No.	Description		Pin No.	Description	
1	2Lo-IN	Second Oscillator Input	29	VREG	Baseband Regulator Output
2	2Lo-OUT	Second Oscillator Output	30	CS-HiCut	Carrier Sens. High Cut
3	VSS	GND for PLL	31	Quad	Quadrature Coil
4	RX-PD	RX Phase Comparison Output	32	VCC1	Vcc1
5	TX-PD	TX Phase Comparison Output	33	IF-PASS	IF Amp. Decuppling
6	PLL-REG	PLL Regulator Output	34	IF-IN	IF Amp. Input
7	fINT	TX Carrier Input	35	IF-PASS	IF Amp. Decuppling
8	LD	Lock Detector Output	36	2MIX-OUT	Second Mixer Input
9	DATA	Serial Data Input	37	GND1	GND1
10	EN	Enable Input	38	2MIX-IN	Varicap Control
11	CLK	Clock Input	39	1MIX-OUT	First Mixer Output
12	DATA-AMP OUT	Data Amp. Output	40	GND2	GND2
13	NC	Not Used	41	RF-IN	First Mixer Input
14	DATA-MUTE CONT	Data Mute Time Constant Adjustment	42	RF-IN	First Mixer Input
15	CS-OUT	Carrier Sensitivity Output	43	VA-CONT	Varicap Control
16	Batt-Lo	Battery Low LED Drive	44	1st-Lo	First Oscillator Tank
17	Batt-CONT	Battery Low Level Control	45	1st-Lo	First Oscillator Tank
18	DATA-MUTE IN	Data Mute Input	46	VCC2	VCC2
19	DATA-AMP IN	Data Amp. Input	47	AF-OUT	AF Amp. Output
20	IF-DET-OUT	IF-DET Output	48	AF-AMP IN	AF Amp. Input
21	NC	Not Used	49	AGND	Analog GND
22	COMP-OUT	COMP Output	50	EXP-OUT	Exp. Output
23	COMP-REF	COMP Output VREF	51	EXP-DET	Exp. Detect
24	C-DET	COMP Detect	52	BREF	Baseband VREF
25	COMP-IN	COMP Input	53	EXP-IN	Exp. Input
26	MIC-OUT	MIC Amp. Output	54	ATT-OUT	Attenuator Output
27	NC	Not Used	55	NC	Not Used
28	MIC-IN	MIC Amp. Input	56	NC	Not Used



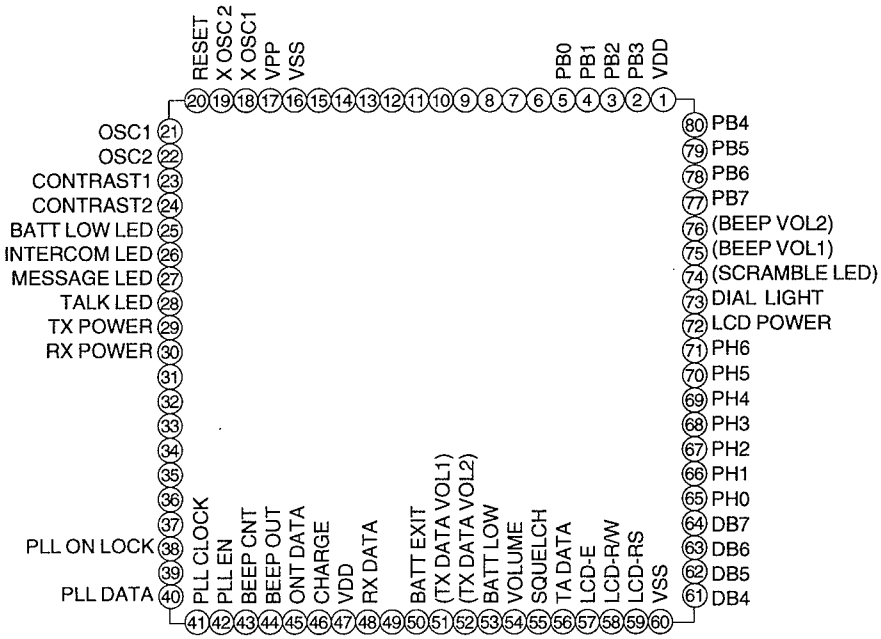
IC5: PQVISC77655S

● **Pin Description**

Pin No.	Name	Description
1	RR	A resistor to ground provides a reference current for the transmit and receive attenuators.
2	RTX	A resistor to ground determines the nominal gain of the transmit attenuator. The transmit channel gain is inversely proportional to the RTX resistance.
3	TXI	Input to the transmit attenuator. Input resistance is nominally 5.0 kohms.
4	TXO	Output of the transmit attenuator. The TXO output signal drives the input of the transmit level detector, as well as the external circuit which drives the telephone line.
5	TLI	Input of the transmit level detector. An external resistor ac coupled to the TLI pin sets the detection level. Decreasing this resistor increases the sensitivity to transmit channel signals.
6	TLO	Output of the transmit level detector. The external resistor and capacitor set the time the comparator will hold the system in the transmit mode after speech ceases.
7	RLI	Input of the receive level detector. An external resistor ac coupled to the RLI pin sets the detection level. Decreasing this resistor increases the sensitivity to receive channel signals.
8	RLO	Output of the receive level detector. The external resistor and capacitor set the time the comparator will hold the system in the receive mode after the receive signal ceases.
9	MCI	Microphone amplifier input. Input impedance is nominally 10 kohms and the dc bias voltage is approximately equal to VB.
10	MCO	Microphone amplifier output. The mic amp gain is internally set at 34 dB (50 V/V).
11	CP1	A parallel resistor and capacitor connected between this pin and Vcc holds a voltage corresponding to the background noise level. The transmit detector compares the CP1 voltage with the speech signal from CP2.
12	CP2	A capacitor at this pin peak detects the speech signals for comparison with the background noise level held at CP1.

Pin No.	Name	Description
13	XO1	Input to the transmit detector system. The microphone amplifier output is ac coupled to the XO1 pin through an external resistor.
14	SKG	High current ground pin for the speaker amp output stage. The SKG voltage should be within 10 mV of the ground voltage at Pin 22.
15	SKO	Speaker amplifier output. The SKO pin will source and sink up to 100 mA when ac coupled to the speaker. The speaker amp gain is internally set at 34 dB (50 V/V).
16	V+	Input dc supply voltage. V+ can be powered from Tip and Ring if an ac decoupling inductor is used to prevent loading ac line signals. The required V+ voltage is 6.0 to 11V (7.5V nominal) at 7.0 mA.
17	AGC	A capacitor from this pin to VB stabilizes the speaker amp gain control loop, and additionally controls the attack and decay time of this circuit. The gain control loop limits the speaker amp input to prevent clipping at SKO. The internal resistance at the AGC pin is nominally 110 kohms.
18	$\overline{CS}$	Digital chip select input. When at a Logic "0" (<0.7V) the Vcc regulator is enabled. When at a Logic "1" (>1.6V), the chip is in the standby mode drawing 0.5mA. An open $\overline{CS}$ pin is a Logic "0". Input impedance is nominally 140 kohms. The input voltage should not exceed 11 V.
19	SKI	Input to the speaker amplifier. Input impedance is nominally 20 kohms.
20	Vcc	A 5.4 V regulated output which powers all circuits except the speaker amplifier output stage. Vcc can be used to power external circuitry such as a microprocessor (3.0 mA max). A filter capacitor is required. The MC34018 can be powered by a separate regulated supply by connecting V+ and Vcc to a voltage between 4.5 V and 6.5 V while maintaining $\overline{CS}$ at a Logic "1".
21	VB	An output voltage equal to approximately Vcc/2 which serves as an analog ground for the speakerphone system. Up to 1.5 mA of external load current may be sourced from VB. Output impedance is 250 ohms. A filter capacitor is required.
22	Gnd	Ground pin for the IC (except the speaker amplifier).
23	XDC	Transmit detector output. A resistor and capacitor at this pin hold the system in the transmit mode during pauses between words or phrases. When the XDC pin voltage decays to ground, the attenuators switch from the transmit mode to the idle mode. The internal resistor at XDC is nominally 2.6 kohms.
24	VLC	Volume control input. Connecting this pin to the slider of a variable resistor provides receive mode volume control. The VLC pin voltage should be less than or equal to VB.
25	ACF	Attenuator control filter. A capacitor connected to this pin reduces noise transients as the attenuator control switches levels of attenuation.
26	RXO	Output of the receive attenuator. Normally this pin is ac coupled to the input of the speaker amplifier.
27	RXI	Input of the receive attenuator. Input resistance is nominally 5.0 kohms.
28	RRX	A resistor to ground determines the nominal gain of the receive attenuator. The receive channel gain is directly proportional to the RRX resistance.

CPU DATA (KX-T4168CR-B)



IC5:PQVI401714FU

Pin No.	Description	I/O	High	High-Z	Low	Pin No.	Description	I/O	High	High-Z	Low
1	Power Terminal					43	Beep Control	O	Low Volume		High Volume
2	Key in 3					44	Beep Clock	O	Normal		Active
3	Key in 2	I			Key	45	Base Unit/Charger	I	Charger		Base Unit
4	Key in 1	I			Key	46	Charge	I	Normal		Charger
5	Key in 0	I			Key	47	Power Terminal				
14	VREFH	I				48	RX Data	I			
15	VREFL	I				49	Not Used				
16	VSS					50	BATT EXE	I	Battery		Non Battery
17	VPP					51,52	Not Used				
18	Sub Clock					53	BATT Low	I	Low		High
19	(32.768KHz)					54	Volume	O	Low		High
20	$\overline{\text{Reset}}$	I	Normal		Reset	55	SQUELCH	I	Weak		Strong
21	Main Clock					56	TX Data	O	Active		Normal
22	(3.992 MHz)					57	LCD E	O	Enable		Disable
23	$\overline{\text{Contrast 1}}$	O		Off	On	58	LCD R/W	O	Read		Write
24	$\overline{\text{Contrast 2}}$	O		Off	On	59	LCD RS	O	Data Reg		Inst Reg
25	$\overline{\text{BATT Low LED}}$	O		Off	On	60	VSS				
26	$\overline{\text{Intercom LED}}$	O			On	61~63	Data Bus 4~6	O	Active		Active
27	$\overline{\text{Message LED}}$	O		Off	On	64	Data Bus 7	O/I	Active		
28	$\overline{\text{Talk LED}}$	O		Off	On	65~70	Key Strobe			Inactive	Active
29	$\overline{\text{TX Power}}$	O		Off	On	71	Not Used				
30	$\overline{\text{RX Power}}$	O		Off	On	72	$\overline{\text{LCD Power}}$			Off	On
31~37	Not Used					73	Dial Light		On		Off
40	PLL Data	O	Active		Normal	74~76	Not Used				
41	PLL Clock	O	Normal		Active	77~79	Option 3~1		X		O
42	PLL EN	O	Latch		Normal	80	Key in 3				Key

ADJUSTMENTS (KX-T4168CH-B)

If your unit have below symptoms, adjust each item using remedy column from the table.

Symptom	Remedy
The base unit dose not respond to a call from portable handset.	Make adjustments in item(A)
The base unit dose not transmit or the transmit frequency is off.	Make adjustments in item(B)
The transmit frequency is off.	Make adjustments in item(C)
The transmit power output is low, and the operating distance between base unit and portable handset is less than normal.	Make adjustments in item(D)
The reception sensitivity of base unit is low with noise.	Make adjustments in item(E)
The transmit level is large or small.	Make adjustments in item(F), (G)
The reception level is large or small.	Make adjustments in item(H)
The unit does not link.	Make adjustments in item(I)

Unit condition:

Remove the antenna from P.C Board of the base unit.

How to set the test mode:

1. CH10 Test Mode

Set S1 to OFF(Power OFF)
↓
Set S2 and S3 to ON.
Set S1 to ON.(unit becomes CH10 talk test mode).

2. CH5 Test Mode

Set S1 to OFF(Power OFF)
↓
Set S2 and S3 to ON.
While pressing Message and Locator/Intercom Key, set S1 to ON.(unit becomes CH5 talk test mode).

- Every time pressing Flash Key, unit changes as follow.
  Talk → Intercom → Standby → Talk → Standby
- Every time pressing Volume up key, unit changes as follow.
  CH10 → CH1 → CH2 → CH3.....CH9 → CH10
- When setting S1 to OFF, unit releases from test mode.

When replacing these parts, adjust as shown in table below table.

Replace Parts	Adjustment items	Test Mode	Adjustment Point	Procedure
IC2, T3	(A) RX VCO Adjustment	CH10 Talk	T3	1. Set S10 to RX VCO side. 2. Adjust T3 so that the reading of the Digital Voltmeter is 2.1V±0.1 V (After adjusting, set S10 to OFF).
D1 ,D2, T13	(B) TX VCO Adjustment	CH10 Talk	T13	1. Set S10 to TX VCO side. 2. Adjust T13 so that the reading of the Digital Voltmeter is 1.4 V±0.1 V(After adjusting, set S10 to OFF).
DUP1, T2, TC1, X2	(C) TX Frequency Adjustment	CH10 Talk	TC1	1. Set S11 to ON. 2. Adjust TC1 so that the reading of the frequency counter is 46.970 MHz±200 Hz(After adjusting, set S11 to OFF).

When replacing these parts, adjust as shown in table below.

Replace Parts	Adjustment items	Test Mode	Adjustment Point	Procedure
T11, Q6	(D) TX Power Adjustment	CH5 Talk	T11	1. Set S12 to ON (S4, S5, S11: OFF). 2. Adjust T11 so that the reading of the RF VTVM is peak level. 3. Adjust T11 so that the reading of the RF VTVM is 220mV±10mV 50 Ω load (clockwise from peak) .
T1	(E) RX Sensitivity Adjustment	CH10 Talk	T1	1. Set S5 and S9 to ON (S2, S4, S8, S12: OFF). 2. Apply a 40dB μVemf output from S.S.G. (modulation frequency 1kHz, dev. 3kHz). 3. Adjust T1 so that the reading of the RF VTVM is maximum output (25~50mV).
T2	(F) Line Output Maximum Adjustment	CH10 Talk	T2	1. Set S5 and S6 to ON (S4, S7, S11, S12: OFF). 2. Apply a 40dB μVemf output from S.S.G. (modulation frequency 1kHz. dev. 3kHz), and adjust T2 so that reading of the AF VTVM is maximum output and turn VR2 clockwise until the line output is 0.5dB down from peak.
VR2	(G) Line Output Level Adjustment	CH5 Talk	VR2	1. Set S5 and S6 to ON (S4, S7, S11, S12: OFF). 2. Apply a 40dB μVemf output from S.S.G (modulation frequency 1kHz. dev. 3kHz). 3. Adjust VR2 so that the reading of the AF VTVM is -11dBm± 0.5dBm (600Ω load) (distortion: less than 7%).
VR1	(H) Line Input Modulation Adjustment	CH5 Talk	VR1	1. Set S4, S5 and S7 to ON (S6, S11, S12: OFF). 2. Input via loop simulator 1.0kHz, -20.0dBm (measured at T-R) signal. 3. Apply a 40 dB μVemf output from S.S.G. (modulation frequency 1kHz, dev. 0kHz). 4. Adjust VR1 so that the reading of the FM Deviation Meter is 4.3kHz±0.1kHz.
VR3, IC2	(I) Carrier Sensitivity Adjustment	CH5 Talk	VR3	1. Set S5 and S8 to ON (S2, S9, S11, S12: OFF). 2. Apply a 0dB μVemf output from S.S.G. (modulation frequency 1kHz, dev. 0kHz). 3. Adjust VR3 so that the oscilloscope becomes Low → High.

The connection of adjustment equipments are as shown in pages 21 and 22.

■ FOR SCHEMATIC DIAGRAM [KX-T4168CH-B (pages 19 and 20)]

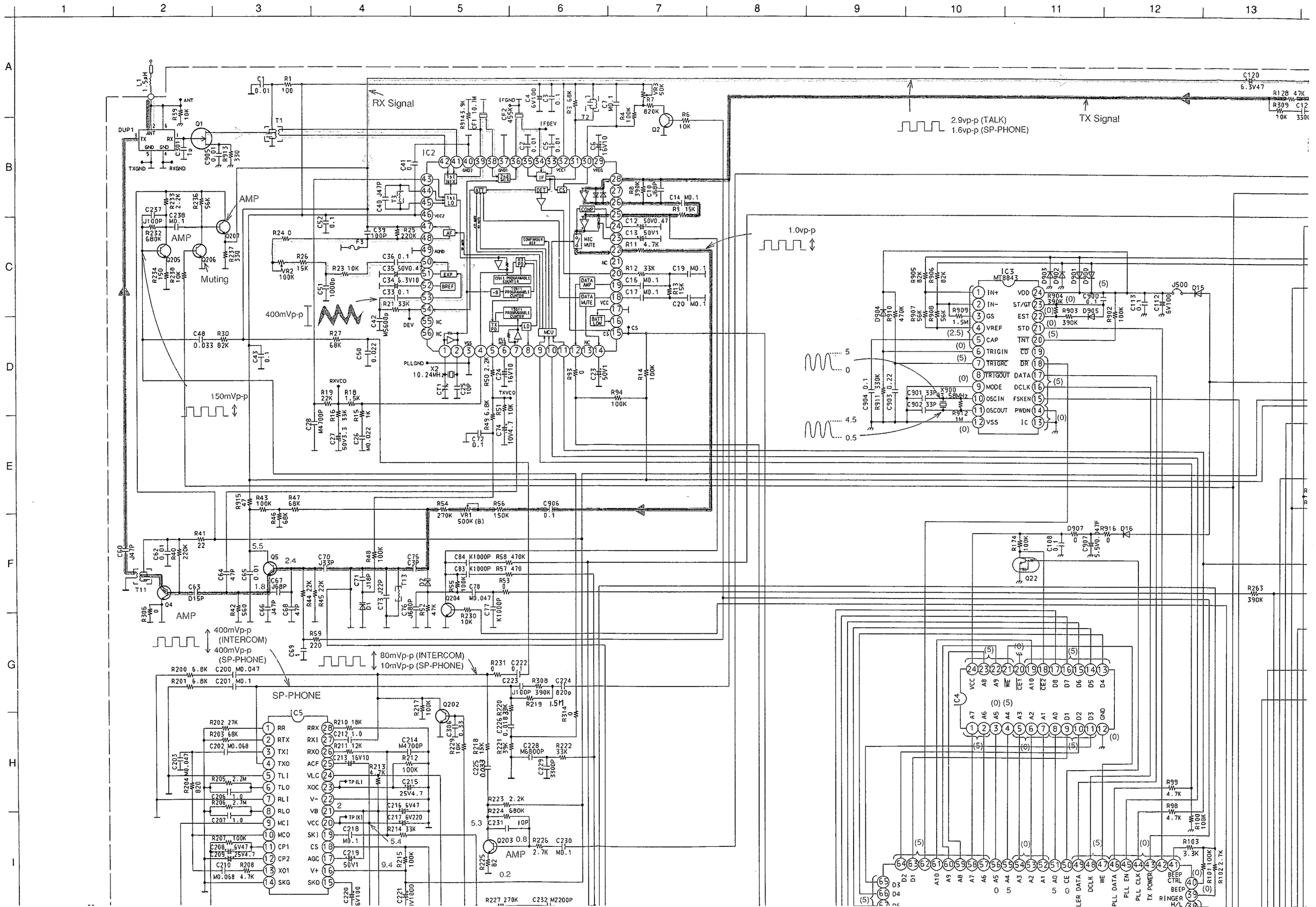
1. S1: Dialing Mode Selector Switch.
2. S2: Ringer Selector Switch.
3. S11~22: Dialing Key Switch.
4. S23: SP-Phone Switch.
5. S24: Message Switch.
6. S25: Hold Switch.
7. S26: Locator/Intercom Switch.
8. S27,S28: Search Switch.
9. S29: Flash Switch.
10. S30: Redial/Pause Switch.
11. DC voltage measurements are taken with electronic voltmeter from negative voltage line.

Important Safety Notice

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

This schematic diagram may be modified at any time with development of new technology.

SCHEMATIC DIAGRAM (KX-T4168CH-B)



SCHEMATIC DIAGRAM (KX-T4168CH-B)

6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18

2.9vp-p (TALK)
1.6vp-p (SP-PHONE)
TX Signal
1.0vp-p
80mVp-p
IC3 MT8843
IC4
Q2 Q6 Q9 Q10 Q11 Q12 Q13 Q14 Q16 Q17 Q19 Q20 Q21 Q22
PC1 PC2 PC3
T2 T7 T8
D150
D26
Regulator
Protector
DC JACK
TEL JACK
TERM1
TERM2
TERM3
8V
0V

AMP

400mVp-p (INTERCOM)
400mVp-p (SP-PHONE)

80mVp-p (INTERCOM)
10mVp-p (SP-PHONE)

SP-PHONE

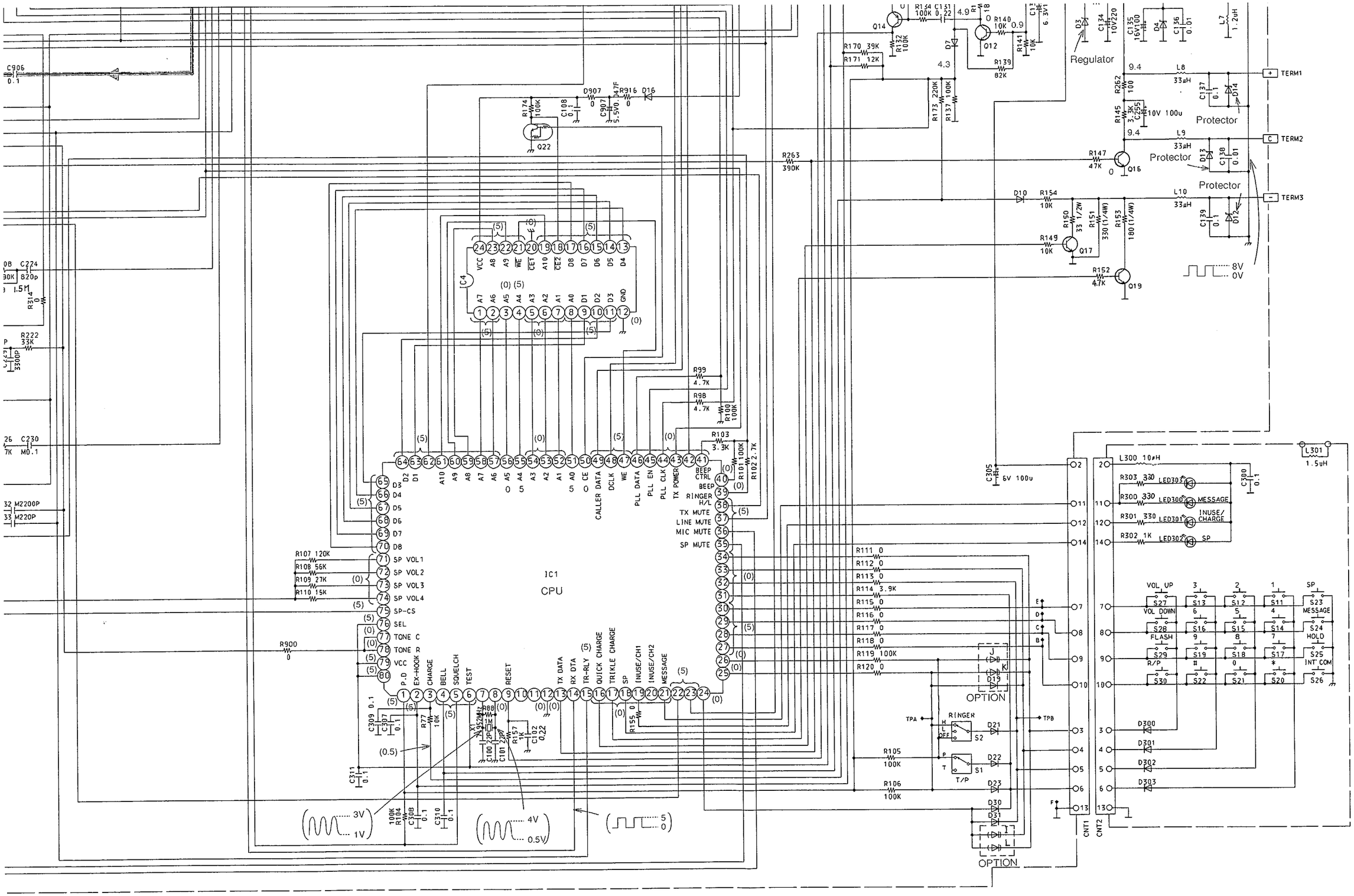
IC5

AMP

5vp-p (INTERCOM)
800mVp-p (SP-PHONE)

IC1
CPU

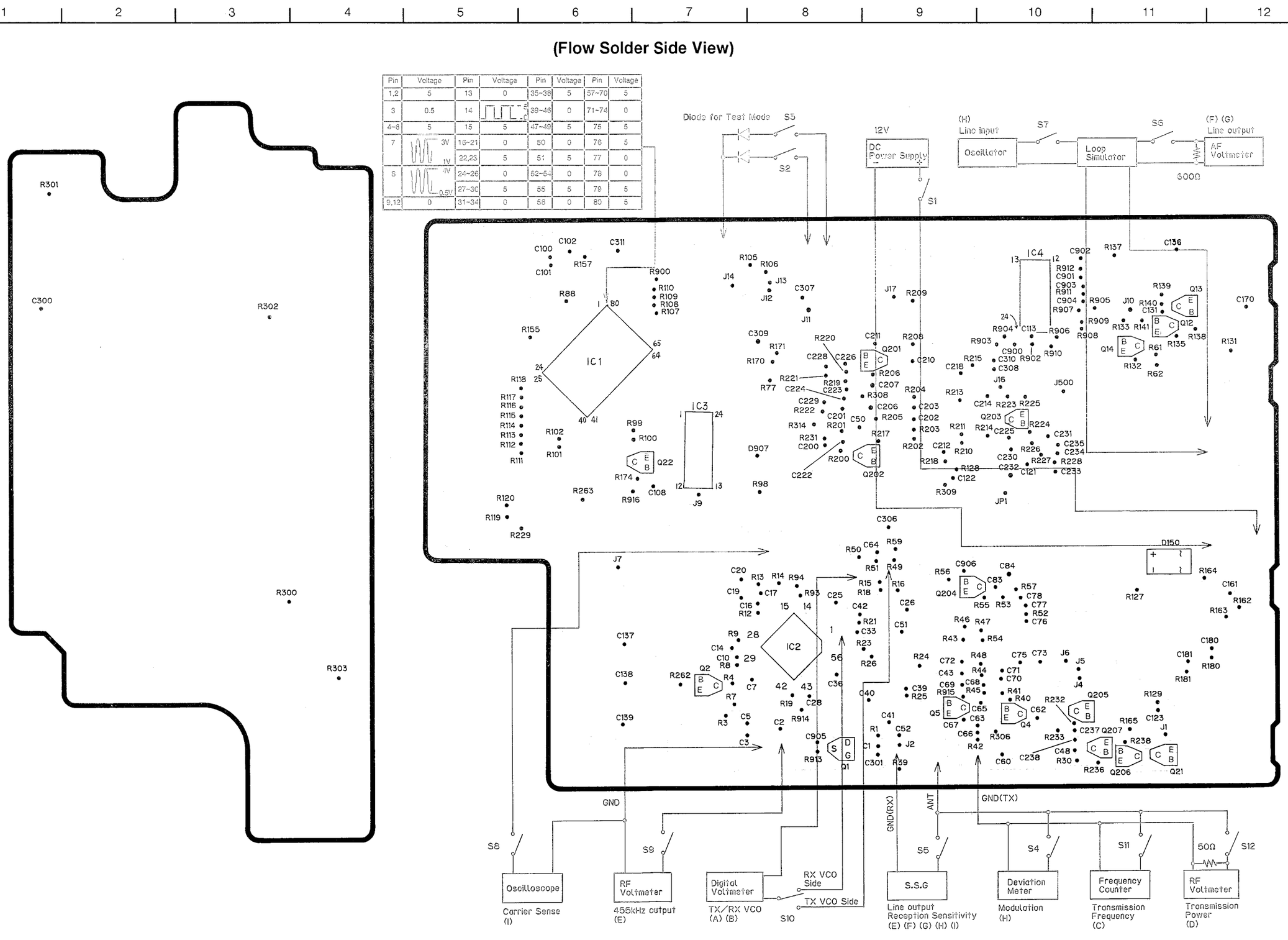
NO Marking : TALK
( ) : Stand By
< > : Charge


IC1
CPU
Regulator
Protector
Protector
Protector
TERM1
TERM2
TERM3
8V
0V
OPTION
OPTION
RINGER
TPA
TPB
T/P
VOL UP
VOL DOWN
FLASH
R/P
MESSAGE
HOLD
INT' COM
SP
INUSE/ CHARGE
LED300
LED301
LED302
L300 10μH
L301 1.5μH
C305 6V 100u
C300 0.1
CNT1
CNT2
SP VOL1
SP VOL2
SP VOL3
SP VOL4
SP-CS
SEL
TONE C
TONE R
VCC
P.D
EX-HOOK
CHARGE
BELL
SQUELCH
TEST
RESET
TX DATA
RX DTA
TR-RLY
QUICK CHARGE
TRIKLE CHARGE
SP
INUSE/CH1
INUSE/CH2
MESSAGE
BEEP CTRL
BEEP
RINGER H/L
TX MUTE
LINE MUTE
MIC MUTE
SP MUTE
CALLER DATA
DCLK
WE
PLL DATA
PLL EN
PLL CLK
TX POWER
R263 390K
R900 0
R99 4.7K
R98 4.7K
R103 3.3K
R102 2.7K
R101 100K
R107 120K
R108 56K
R109 27K
R110 15K
R111 0
R112 0
R113 0
R114 3.9K
R115 0
R116 0
R117 0
R118 0
R119 100K
R120 0
R105 100K
R106 100K
R155 0
R77 10K
R104 100K
C309 0.1
C307 0.1
C311 0.1
C308 0.1
C310 0.1
C100 22P
C101 22P
R157 1K
C102 0.22
X1 4.032MHz
3V
1V
4V
0.5V
5
0
Q14
Q12
Q22
Q16
Q17
Q19
R154 100K
C131 0.22
R140 10K
R141 10K
R139 82K
R170 39K
R171 12K
R132 100K
R174 100K
C108 0.1
C907 5.5V0.47F
R916 0
D907 0
D16
D7
D3
C134 10V220
C135 16V100
D4
C136 0.01
L7 1.2uH
R262 100
L8 33μH
C137 0.1
D14
R145 3.3K
C255 10V 100u
L9 33μH
D13
C138 0.01
R147 47K
R173 220K
R137 100K
D10
R154 10K
L10 33μH
C139 0.1
D12
R150 33 1/2W
R151 330 (1/4W)
R153 180 (1/4W)
R149 10K
R152 4.7K
C906 0.1
C224 820p
1.5M
R314 0
R222 33K
3300P
M0.1
C230
M2200P
M220P
R303 330
R300 330
R301 330
R302 1K
S27
S28
S29
S30
S13
S16
S19
S22
S12
S15
S18
S21
S11
S14
S17
S20
S23
S24
S25
S26
D300
D301
D302
D303
D19
D21
D22
D23
D30
D31
S2
S1
J
K
L
E
D
C
B
F
2
11
12
14
7
8
9
10
3
4
5
6
13

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM (KX-T4168CH-B)

(Flow Solder Side View)

Pin	Voltage	Pin	Voltage	Pin	Voltage	Pin	Voltage
1,2	5	13	0	35~38	5	57~70	5
3	0.5	14		39~46	0	71~74	0
4~6	5	15	5	47~49	5	75	5
7	3V / 1V	16~21	0	50	0	76	5
8	4V / 0.5V	22,23	5	51	5	77	0
		24~26	0	52~54	0	78	0
		27~30	5	55	5	79	5
9,12	0	31~34	0	56	0	80	5



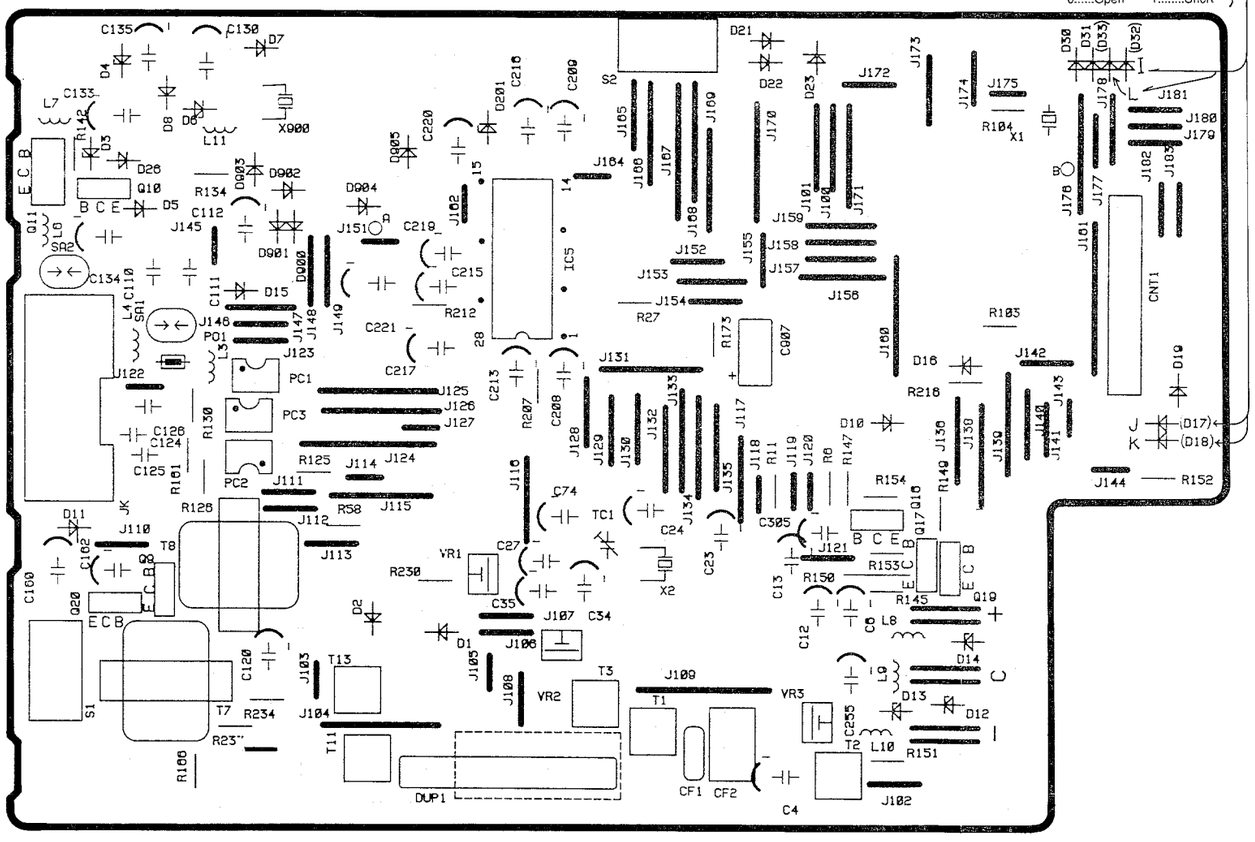
CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM (KX-T4168CH-B)

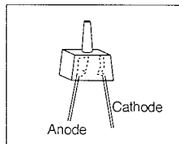
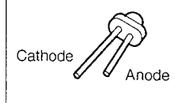
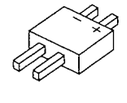
(Component View)

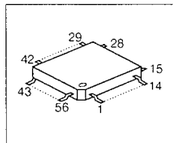
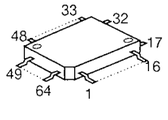
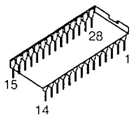
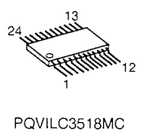
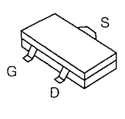
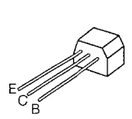
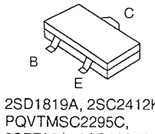
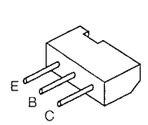
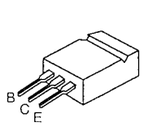
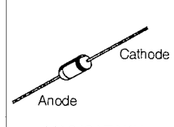
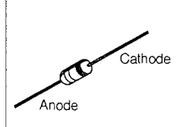
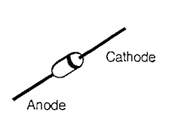
OPTION

	Function	Open	Short
I	%Break	61%	67%
J	Dial Speed	10PPS	20PPS
K	Flash	K L 0 0	700ms
		0 1	600ms
L	Flash	1 0	250ms
		1 1	80ms

0.....Open 1.....Short

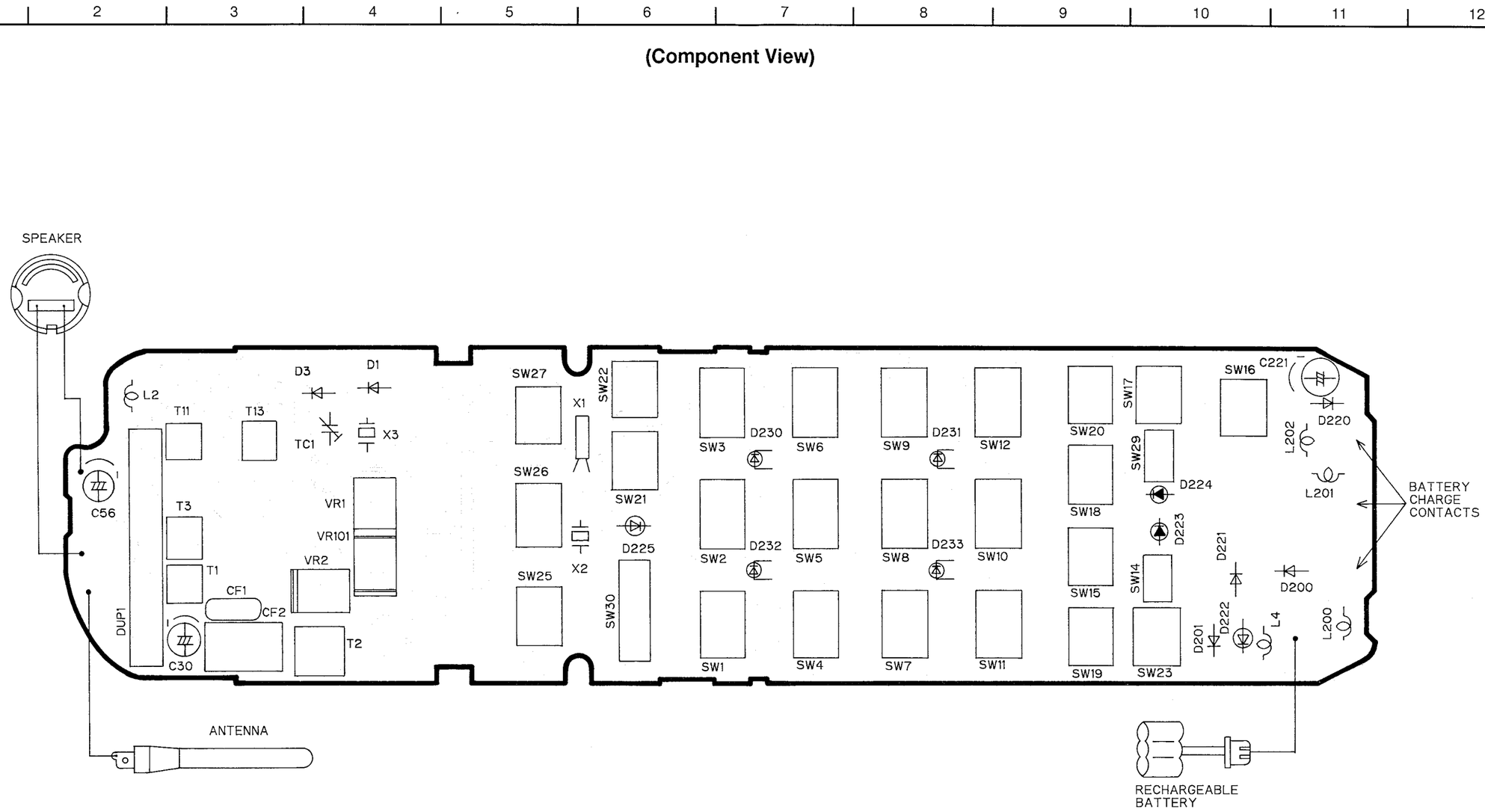


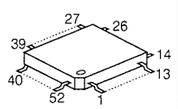
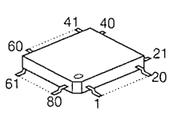
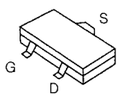
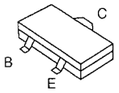
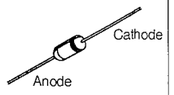
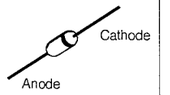
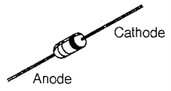
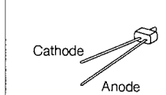
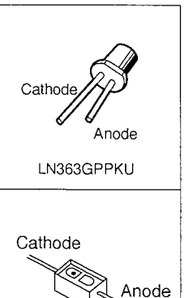
 LN222RPH LN322GKGAH	 LN801LPDJA	 PQVDS1ZB40F1

 AN6185NFA	 PQVI4639RA29	 PQVISC77655S	 PQVILC3518MC PQVIMT8843AS	 2SK543	 2SC1740S	 2SD1819A, 2SC2412K, PQVTMSC2295C, 2SB709A, 2SD1994A, UN5213, PQVTFB1A4M	 2SA1776P, 2SD1991A	 2SD2136	 MA840ATAKU, MA4100, MA4300	 MA4062, MA4047	 1SS120, PQVD1SV145

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM (KX-T4168CR-B)

(Component View)



 PQVISC79159A	AN6183SE1 PQVISC78184D	 PQVI401714FU	 2SK543	 2SC2265, 2SC2412K 2SD1819A,2SB709A XN1116, UN5113	 MA840BTAKU MA700A	 PQVD1SV145, 1SS120	 MA4068	MA110	 LN330GKGAC, LN230RKRAC	 LN363GPPKU LN01201CU3LF

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM (KX-T4168CR-B)

(Flow Solder Side View)

OPTION

	Function	Open	Short
A	Test Mode	Normal	CH10
B	Test Mode	Normal	CH1
E	RX Interval	×	○
G	Out of Alarm	×	○

Pin	Voltage	Pin	Voltage	Pin	Voltage	Pin	Voltage	Pin	Voltage	Pin	Voltage
1~5	4	21	2	25	2.5	46~56	0	60	0	66,67	0
6~17	0	22	3.5 / 1	27	0	57	4	61	2	68~70	4
18,19	4 / 0			28~30	4	58	2	62	4	71~80	0
		23	0	36~40	0	59	4 / 0	63,64	0		
20	4	24	4	41~45	4			65	4		

SCHEMATIC DIAGRAM (KX-T4168CR-B)

IC5···(Stand By Mode)

Pin	Voltage	Pin	Voltage	Pin	Voltage	Pin	Voltage	Pin	Voltage	Pin	Voltage
1~5	4	21	2	25	2.5	46~56	0	60	0	68~70	4
6~17	0	22	3.5 / 1	27	0	57	4	61	2	71~80	0
18,19	4 / 0			28~30	4	58	2	62	4		
		23	0	38~40	0	59	4 / 0	63,64	0		
20	4	24	4	41~45	4			65	4		

NO Marking : TALK
( ) : Stand By
< > : Charge

ADJUSTMENTS (KX-T4168CR-B)

If your unit have below symptoms, adjust each item using remedy column from the table.

Symptom	Remedy
The movement of Battery Low Indicator is wrong.	Make adjustments in item(A)
The base unit dose not respond to a call from portable handset.	Make adjustments in item(B)
The base unit dose not transmit or the transmit frequency is off.	Make adjustments in item(C)
The transmit frequency is off.	Make adjustments in item(D)
The transmit power output is low, and the operating distance between base unit and portable handset is less than normal.	Make adjustments in item(E)
The reception sensitivity of base unit is low with noise.	Make adjustments in item(F)
Does not link between base unit and portable handset.	Make adjustments in item(G), (H)
The transmit level is large or small.	Make adjustments in item(I)

Unit condltion:
1. Remove the antenna lead wire from P.C Board of portable handset.
2. Power Supply: DC 3.9V
3. Volume switch: HIGH
4. Speaker Load: 130Ω

How to set the test mode.
CH10 Test Mode

1. After connecting the test diode DA, and apply a power supply DC 3.9 V. (The unit becomes CH10 Talk)
2. Press the talk switch. (The unit becomes CH10 standly)
3. Press the Talk Switch.
4. Press the Search ∧ switch (S21),

CH10 → CH1 → CH2·····CH9

When replacing these parts, adjust as shown in table below.

Replace Parts	Adjustment items	Test Mode	Adjustment Point	Procedure
VR1	(A) Battery Low Adjustment	CH10 Talk	VR1	1. Set S1 to ON. 2. Set the power supply voltage to DC 3.57V, and adjust VR1 so that the reading of oscilloscope is High → Low.
IC1, TC1, X3, T13	(B) TX VCO Voltage Adjustment	CH10 Talk	T13	1. Set S2 to TX VCO side. 2. Adjust T13 so that the reading of digital voltmeter is 2.0 V ± 0.1 V (After adjusting, set S2 to OFF).
IC1, TC1, X3, T3	(C) RX VCO Voltage Adjustment	CH10 Talk	T3	1. Set S2 to RX VCO side. 2. Adjust T3 so that the reading of digital voltmeter is 2.0 V±0.1 V (After adjusting, set S2 to OFF).
TC1, X3, IC1	(D) TX frequency Adjustment	CH10 Talk	TC1	1. Set S3 to ON. 2. Adjust TC1 so that the reading of frequency counter is 49.970 MHz±200 Hz (After adjusting, set S3 to OFF).

When replacing these parts, adjust as shown in table below.

Replace Parts	Adjustment items	Test Mode	Adjustment Point	Procedure
T11	(E) TX Output Adjustment	CH10 Talk	T11	1. Set S4 to ON (S3: OFF). 2. Adjust T11 for 250mV~450mV output on RF VTVM (500Ω load) (After adjusting, set S4 to OFF).
T1, T2	(F)RX Adjustment (Speaker Output) (2nd IF Output)	CH1 Talk	 T2 T1	1. Set S3, S5, S8, S9 to ON (S4, S10: OFF). 2. Apply a 50 dB μVemf output from S.S.G. (modulation frequency 1 kHz, dev. 3kHz) 3. Adjust T2 so that the reading of AF VTVM is maximum output. (-27 ± 2dB) 4. Apply a 50 dB μVemf output from S.S.G. (modulation frequency 1kHz, dev. 3kHz) 5. Adjust T1 so that the reading of RF VTVM is maximum output (18~36mV).
VR2	(G) Carrier Sensitivity Adjustment	CH1 Stand-by	VR2	1. Set S5, S6 to ON (S1: OFF). 2. Apply a 8 dB μVemf output from S.S.G.(modulation frequency 1kHz, dev. 0kHz) and adjust VR2 when oscilloscope becomes to low.
	(H) Data Moudulation of Confirmation	CH10 Talk	—	1. Set S10 to ON (S3, S4: OFF). 2. Keep pressing the flash button. 3. Confirm for a 6.5~8.5 kHz FM Deviation Meter reading.
VR101	(I) MIC Modulation Factor Adjustment	CH10 Talk	VR101	1. Set S8, S10 to ON (S3, S4: OFF). 2. Apply a MIC signal (1kHz, -40 dBm at 600 Ω load). 3. Adjust VR 101 so that the reading of FM Deviation Meter is 2.5kHz±0.1kHz.

The connections of adjustment equipments are as shown in pages 27 and 28.

■ For SCHEMATIC DIAGRAM [KX-T4168CR-B (Pages 29, 30)]

1. SW1~10, 12: Dialing Switch
2. SW11: Tone Switch
3. SW14: Message Switch
4. SW15: Flash Switch
5. SW16: Channel Switch
6. SW17: Volume/Ringer Switch
7. SW18: Call Wait Switch
8. SW19: Directory Switch.
9. SW20: Redial/Pause Switch
10. SW21, 22: Search Switch.
11. SW23: Program Switch
12. SW25~27: Function Switch.
13. SW30: Talk Switch
14. DC voltage measurements are taken with electronic voltmeter from negative voltage line. (Talk Posittion)

This schematic diagram may be modified at any time with the development of new technology.

FREQUENCY TABLE (MHz)

	KX-T4168CH-B		KX-T4168CR-B	
	Transmit Frequency	Receive Frequency	Transmit Frequency	Receive Frequency
CH1	46.610	49.670	49.670	46.610
CH2	46.630	49.845	49.845	46.630
CH3	46.670	49.860	49.860	46.670
CH4	46.710	49.770	49.770	46.710
CH5	46.730	49.875	49.875	46.730
CH6	46.770	49.830	49.830	46.770
CH7	46.830	49.890	49.890	46.830
CH8	46.870	49.930	49.930	46.870
CH9	46.930	49.990	49.990	46.930
CH10	46.970	49.970	49.970	46.970

RF SPECIFICATION

BASE UNIT (KX-T4168CH-B)

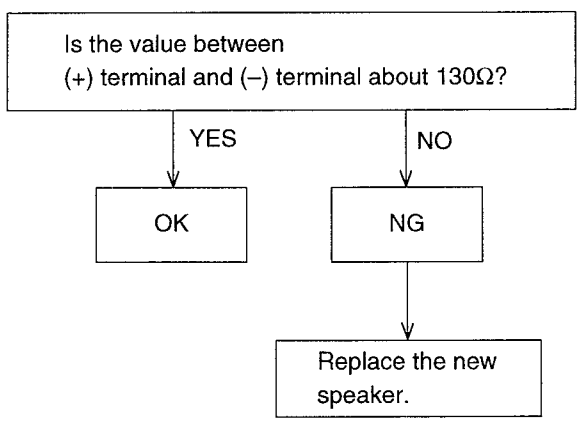
Item	Value	Refer to —.	Remarks
TX Frequency	46.970 MHz±200Hz	Page 17 (C)	at CH10
TX Power	220 mV±10mV	Page 18 (D)	at CH5
TX Modulation factor	4.2 kHz~4.4 kHz	Page 18 (H)	at CH5
TX Modulation Distortion	Less than 7%	———	
TX Max. Modulation factor	6.0 kHz~8.0 kHz	———	
Data Modulation factor	5.0 kHz~7.0 kHz	———	

PORTABLE HANDSET (KX-T4168CR-B)

Item	Value	Refer to —.	Remarks
Practical Sensitivity	Less than 9 dBμV	———	at CH5
Carrier Sensitivity	Less than 8 dBμV	———	
TX Frequency	49.970 MHz±200Hz	Page 31 (D)	at CH10
TX Output	250 mV~450 mV	Page 32 (E)	at CH10 (Antenna soldering point 50Ω Load)
Data Modulation factor	6.5 kHz/dev~8.5 kHz/dev	Page 32 (H)	at CH10
MIC Modulation factor	2.4 kHz/dev~2.6 kHz/dev	Page 32 (I)	at CH10 (MIC terminal -40dBm Input)

HOW TO CHECK THE PORTABLE HANDSET SPEAKER

1. Prepare the digitial voltmeter, and set the selector knob to ohm meter.
2. Put the probes at the speaker terminals as shown in Fig.10.
3.



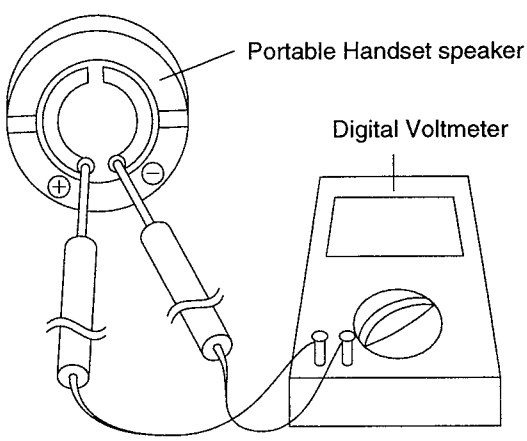
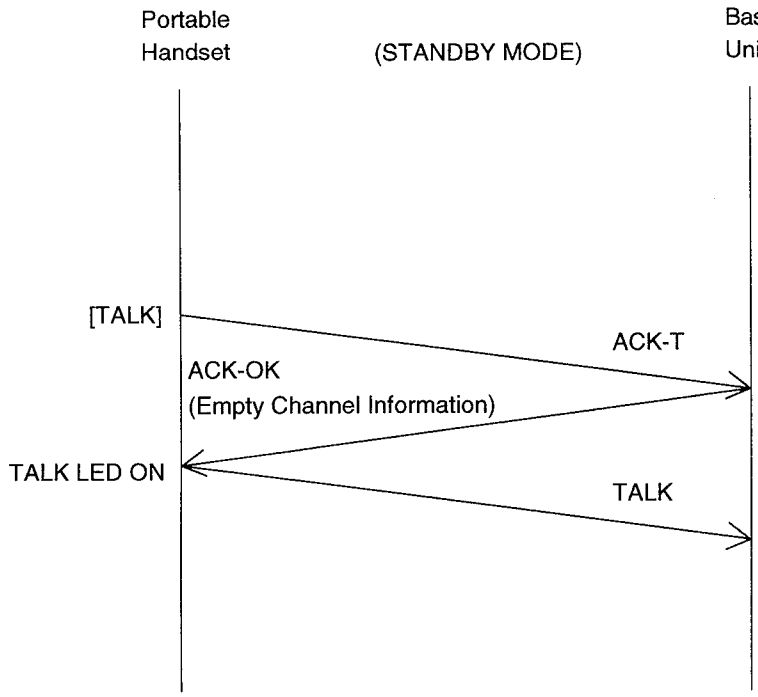


Fig. 10

EXPLANATION OF CPU DATA COMMUNICATION

1. Calling

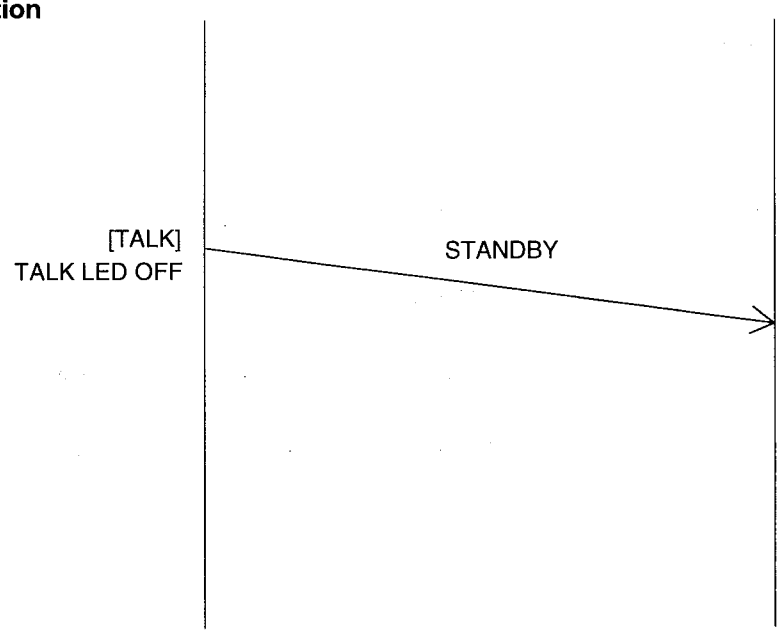


When calling, a communication request DATA (ACK-T) is transmitted from the Portable Handset first, and a permitting data (ACK-OK) is returned from the Base Unit to it, then a communication data (TALK) is transmitted from the Portable Handset.

OFF HOOK
IN USE LED ON

The permitting DATA (ACK-OK) from Base Unit to Portable Handset includes the empty channel information stored in Base Unit. After transmitting the communication DATA (TALK) from Portable Handset to Base Unit, the channel is used.

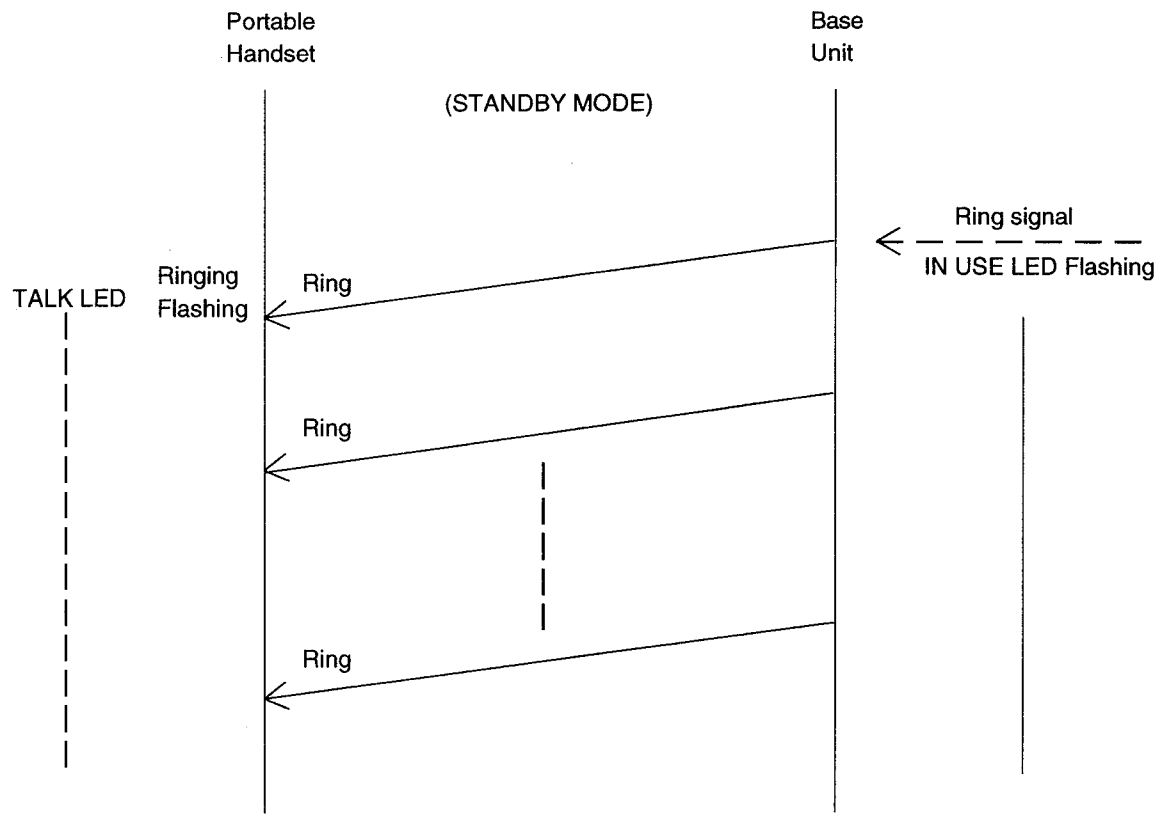
2. To terminate Communication



When the TALK button on Portable Handset is pressed during communication, a LINK terminating DATA (STANDBY) is sent to terminate communication.

ON HOOK
IN USE LED OFF

3. Ringing



After detecting the Ring signal from circuit, Base Unit sends a ring signal DATA (Ring), then the Portable Handset starts ringing.

4. Ports for transmitting and receiving of data

Portable Handset :	transmitting .... 56 Pin	receiving ..... 48 Pin
Base Unit :	transmitting .... 13 Pin	receiving ..... 14 Pin

5. Waveform of DATA used for cordless transmission and reception

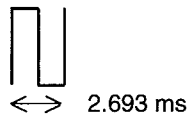
The DATA which is transmitted from the Portable Handset to the Base Unit is combination of DATA 0, DATA 1, DATA Delimt, Pre data and End data of P1.

The DATA which is transmitted from the Base Unit to the Portable Handset is combination of DATA 0, DATA 1, DATA Delimt, Pre data and End data of P2.

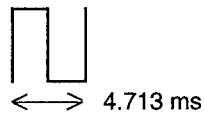
PORTABLE HANDSET

Transmitting DATA Format

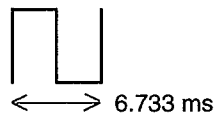
DATA 0



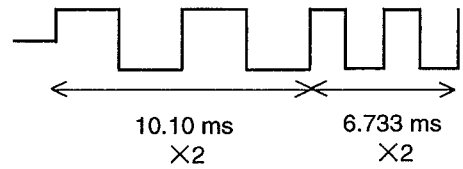
DATA1



DATA Delimt

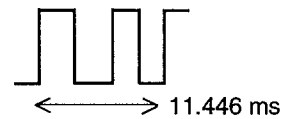


Pre data



33.666 ms

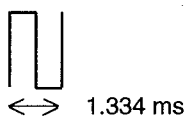
END data



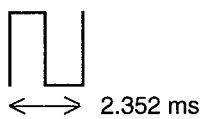
BASE UNIT

Transmitting DATA Format

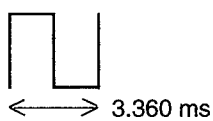
DATA 0



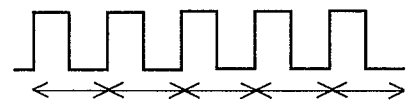
DATA1



DATA Delimt

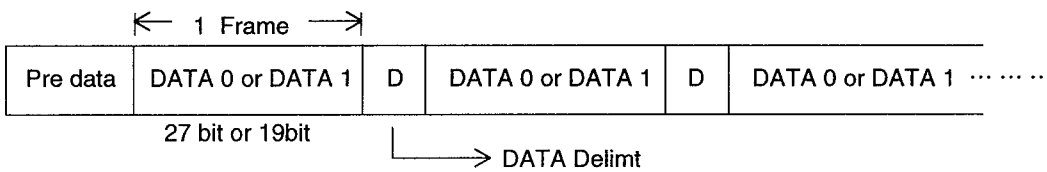


Pre data



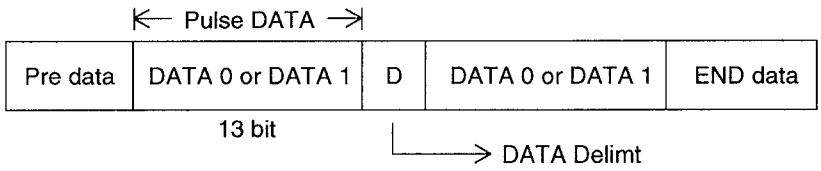
END data

6. When LINKing



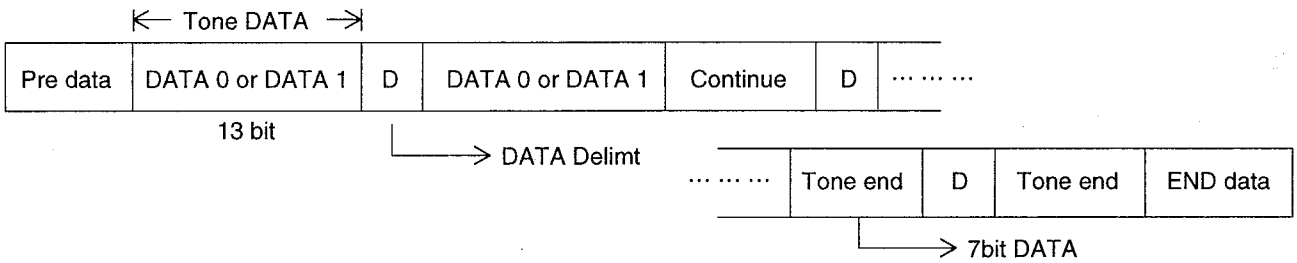
When LINKing from the Portable Handset (when becoming STBY to TALK), DATA is transmitted in above format. The combined portion of DATA 0 and DATA 1 is transmitted in LINK requesting DATA(33bit) format first.Then,when LINK OK(ACK-OK) DATA (19bit) is returned from the Base Unit, it is sent as LINK from DATA after changing the combination of DATA 0 and DATA 1. And the DATA Delimt is between each Frame as a stop.
The contents of LINK requesting DATA and LINK from DATA are different depending on each operation.

7. Pulse Dial



When executing Pulse Dial,the Pulse Dial DATA is transmitted from the Portable Handset to the Base Unit in above format. The combination of DATA 0 and DATA 1 are changed by each Dial No. And the DATA Delimt is between each Frame as a stop. The number of Frame is 2.

8. Tone Dial



When executing Tone Dial, Tone Dial DATA is transmitted from the Portable Handset to the Base Unit in above format. The DATA is changed by Dial No. as same as Pulse Dial. When Tone Dialing, DATA (Continue DATA) that the key is pressed continuously is sent to the Base Unit during the key is pressed. When depressing the key, the TONE Dial exterminating DATA (Tone end DATA) is send, and the END data is sent finally.

NOTE

65,000 kinds of the security code are available for the model KX-T4168C-B. Each time the portable unit is set on the cradle of the base unit (for charging), the CPU automatically change the security code.

BLOCK DIAGRAM (KX-T4168CH-B)

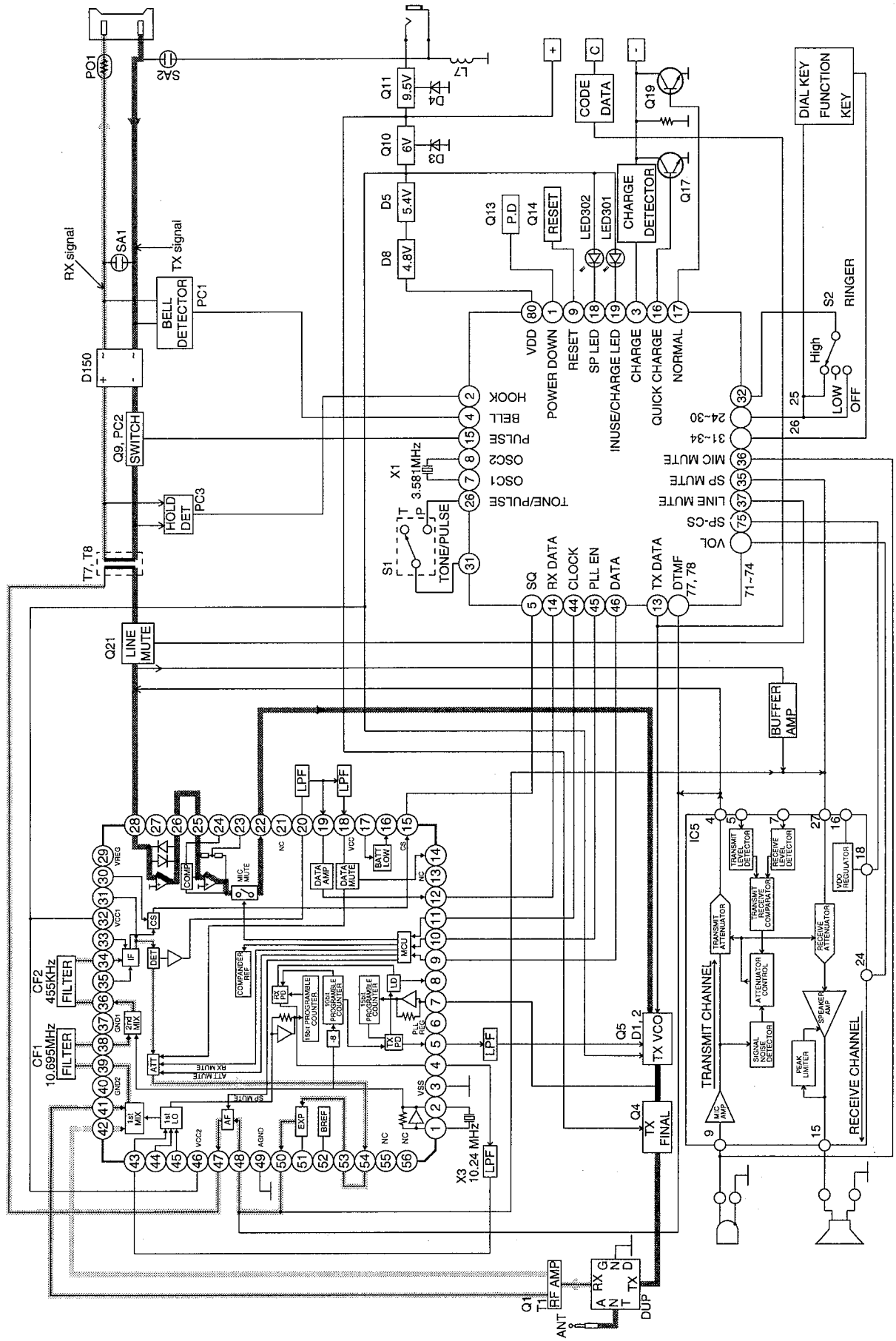


Fig. 11

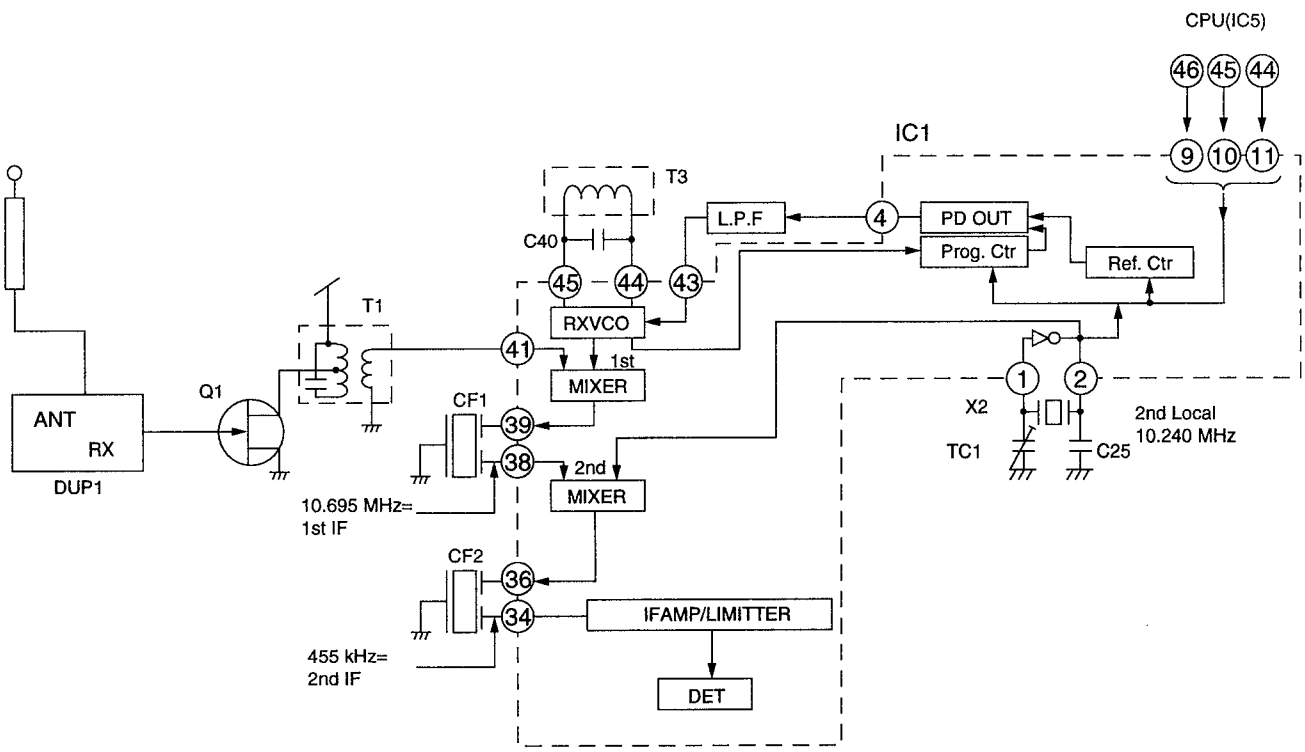
NEW CIRCUIT OPERATION (KX-T4168CH-B)

■ RECEIVER RF IF CIRCUIT

Circuit Operation:

The signal of 49 MHz band (49.67~49.99MHz) which is input from ANT is filtered at DUP1, passes through the filter AMP of 49 MHz band at T1 and Q1, and is input to Pin 41 of IC2.
RX VCO which oscillates at T3 and Pins 44, 45 of IC2 is input to program control at inside of IC2, 1st local frequency is controlled to assigned channel by serial data which is output, from Pins 44, 45 and 46 of IC1 (CPU), makes loop with Phase Detector Out and RX VCO, and locks 1st local frequency.
The input signal of Pin 41 of IC2 and 1st local frequency output from RX VCO are mixed at inside of IC2, then it passes through CF1, and 1st IF frequency of 10.695 MHz is generated. Farther, the 10.240 MHz and 10.695 MHz which are oscillated at X2 and Pins 1, 2 of IC2 are mixed at inside of IC2 and filtered at CF2, and 2nd IF 455 Hz is output.

Circuit Diagram

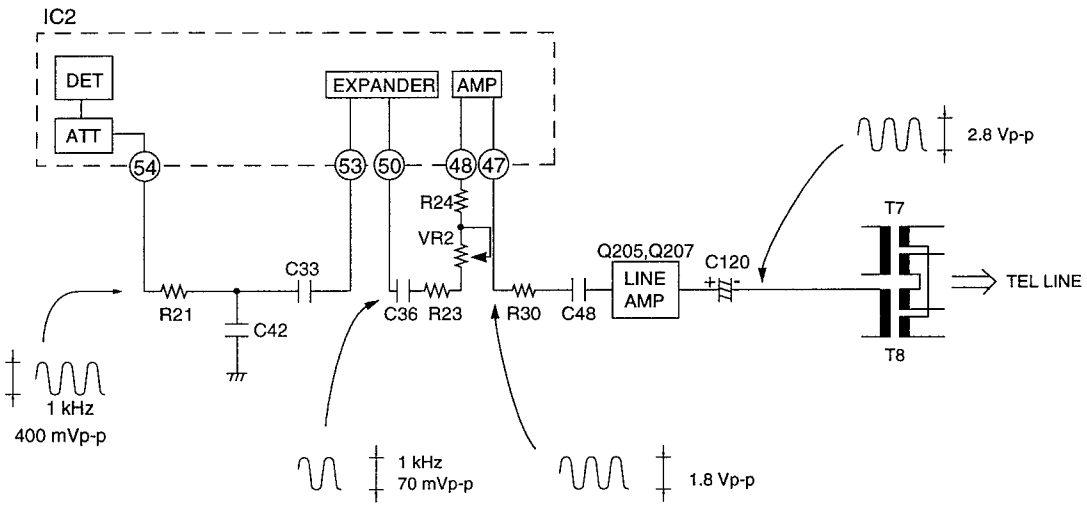


■ RECEIVER SIGNAL CIRCUIT

Circuit Operation:

1. The detected signal passes through R21, C33, is input to Pin 53 of IC2.
2. Then, it gpes through L.P.F. whith consists of Pin 53 of IC1 and external capacitor and resistor, and internal EXP/AMP of IC2 and is output from Pin 47 of IC2.
3. Then it goes through Buffer Amp which consists of Q205, Q207 and tel line interface trans T8, and is output to TEL LINE.

Circuit Diagram



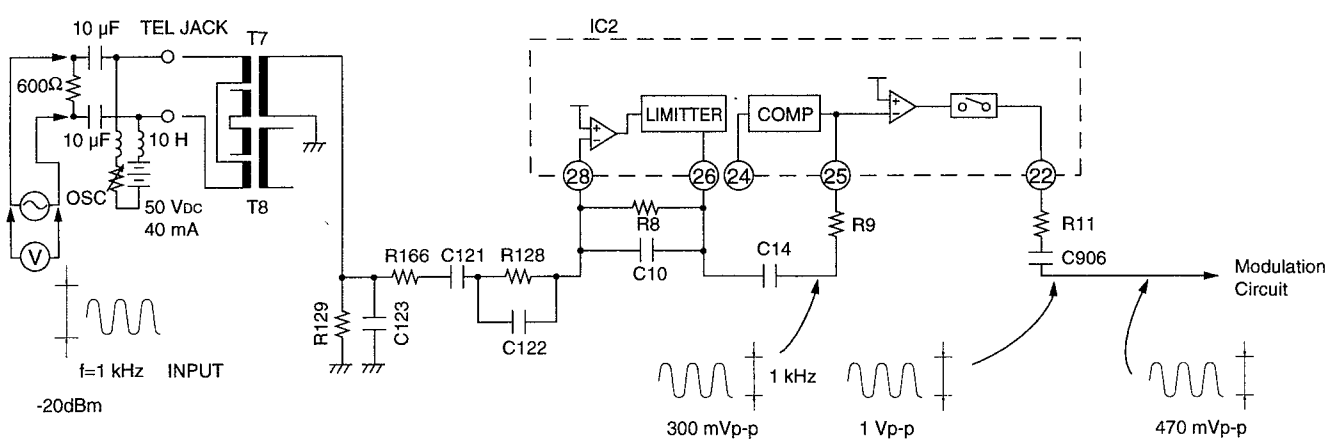
Note: When applying the SSG input level of reception 60 dBμV
(3.0 kHz Deviation, f=1 kHz) from antenna, all waveform are measured.

■ TRANSMITTER SIGNAL CIRCUIT

Circuit Operation:

1. The signal input from TEL LINE goes through tel line interface trans T7 → C121, R128 and C122 → Pin 28 of IC2 Amp → LIMITTER, COMPRESSOR, and is output from Pin 22 of IC2.
2. The signal output from Pin 22 passes through C906 and R11, and is input to modulator circuit.

Circuit Diagram



■ CALLING LINE IDENTIFICATION CIRCUIT (Caller ID)

Function:

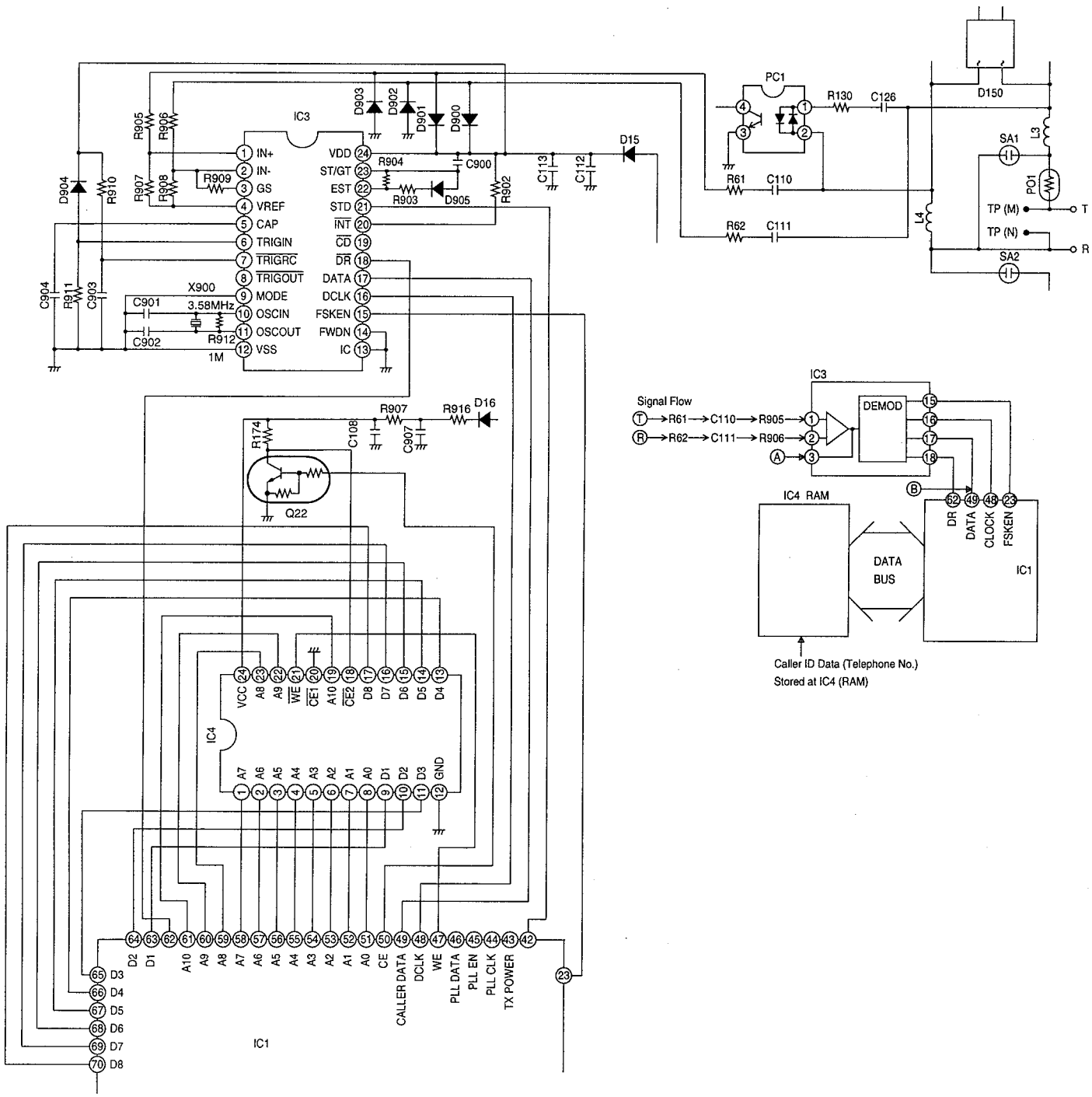
The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used.

The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1200 Hz sine wave, and data 1 a 2200 Hz sine wave.

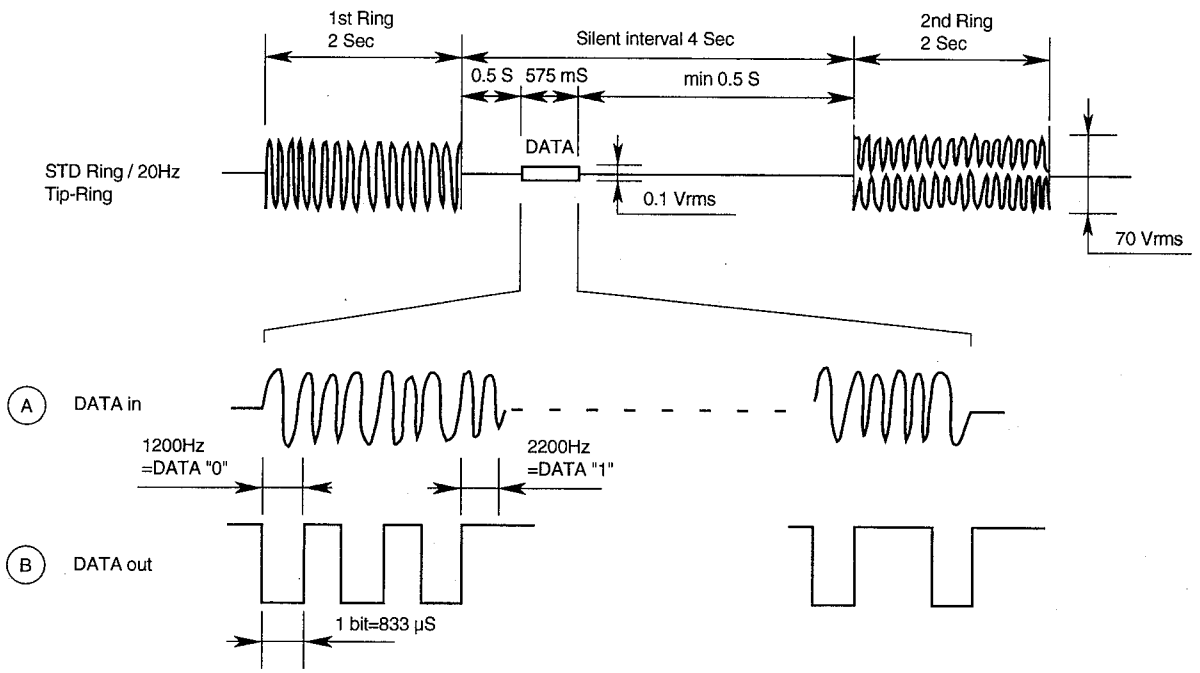
There are two type of the message format which can be received: i.e. the single message format and plural message format.

The plural message format allows to transmit the name and data code information in addition to the time and telephone number data.

Circuit Diagram

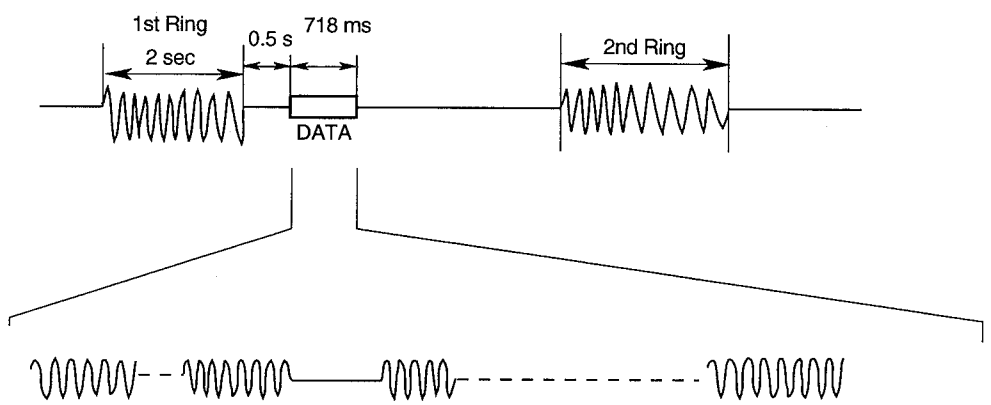


● Single message format



month		day		hour		minute		number
04	–	15	–	16	–	35	–	2013487000

● Plural message format



DATA CODE	NAME
201	John Smith

month		day		hour		minute		number
04	–	16	–	16	–	35	–	2013487000

NORMAL CIRCUIT OPERATION (KX-T4168CH-B)

■ TELEPHONE LINE INTERFACE

Circuit Operation:

•ON HOOK

Q9 is open, Q9 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

• SPECIFICATIONS

In the on-hook state (idle), the current flows between the telephone line and the unit is as follows:

T → C126 → R130 → PC1 → R171

The DC component is blocked by C126: thereby providing an on-hook condition.

The AC interface impedance is over 47 kΩ; thus, satisfying the telephone company requirements.

■ TELEPHONE MODE OPERATION

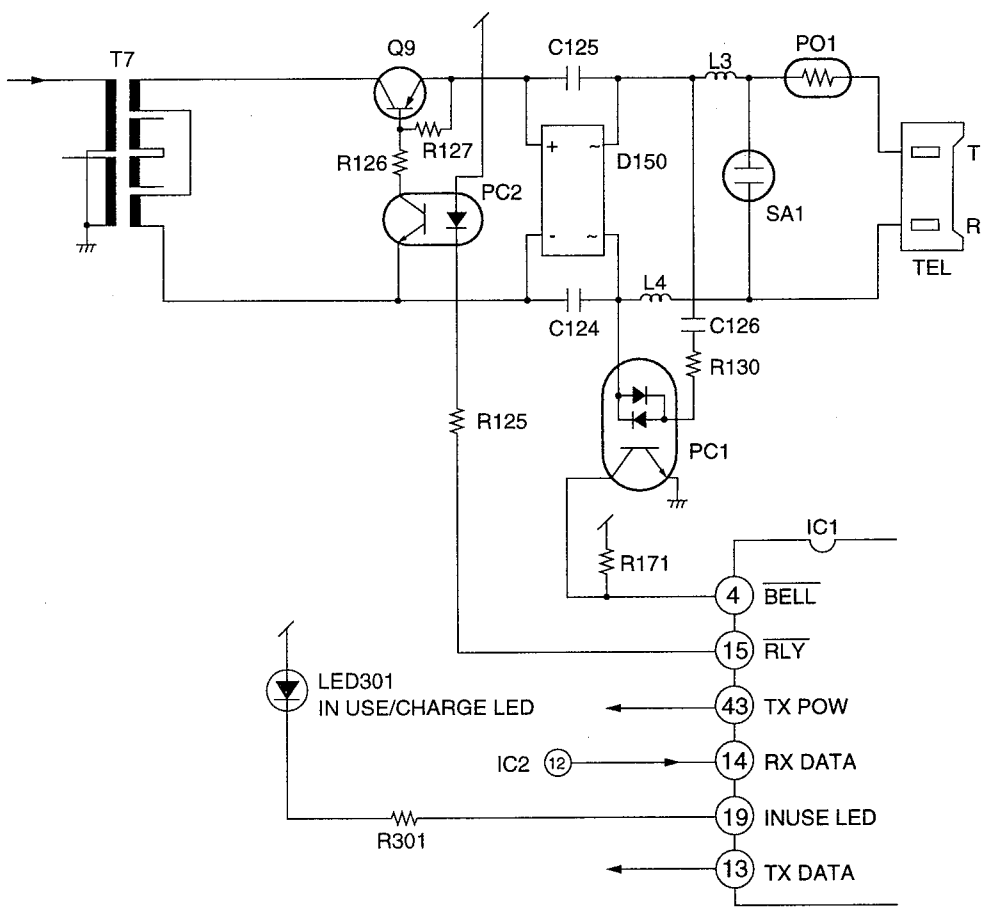
When a ring signal enters from the Line

1) The ring detection circuit, i.e., the photocoupler PC1, begins to operate and its output is input to Pin 4 of IC1 (CPU).
2) To show the arrival of the ring signal to the portable handset, Pin 43 of IC1 enters into the transmit mode thus becoming a High and the ring data having the code set by Pin 13 of IC1 is sent to portable handset as a modulated output signal.
3) Upon receiving the ring data, and the portable handset is switched from standby to the talk mode, the base unit receives a carrier modulated by the data indicating a switch from standby to talk.This data is then demodulated at the base unit and passes through a data signal amplifier of IC2, This signal is then inputted to Pin 14 of IC1, via Pin 15 of IC1 which causes Q9 and PC2 to release the muting, and enable talk.

Circuit-making from the portable handset

1) When the operator of the portable handset presses the talk button, data is transmitted the base unit , this data is then demodulated by the base unit and passed through data signal amplifier of IC2 and enters Pin 14 of IC1.
2) When the codes coincide, Pin 14 of IC1 becomes a "High". At this time the transmit condition is enabled and the photocoupler PC2 is turned on.
3) Further, and IN USE signal is sent out from Pin 19 of IC1, thus dimly lighting the IN USE/CHARGE LED (LED301).

Circuit Diagram



■ SPEAKERPHONE OPERATION

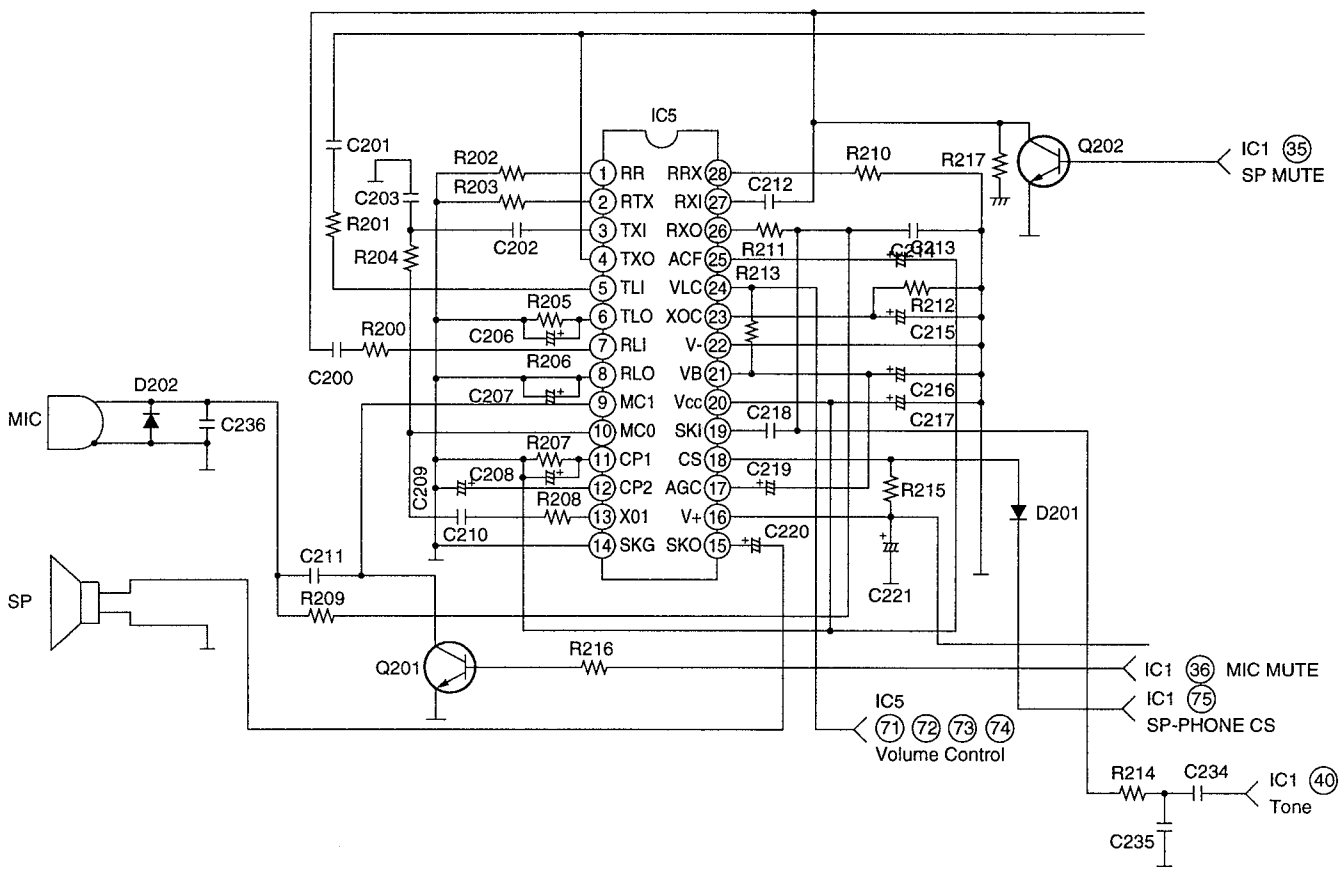
When a ring signal is received

When the ring signal is received from line, photocoupler PC1 operates, the output enters Pin 4 of IC1 (CPU), Pin 43 of IC1 goes High, and the system goes into the Send mode. Also, Pin 75 of IC1 goes Low, activating IC5 (speakerphone). Next, Pin 40 of IC1, output the monitor tone which enters Pin 19 of IC5 and is then output from the speaker.

Subsequently, the same operation as for Line takes place.

Next, when the speakerphone switch is turned ON, the line in which the ring is ringing is selected, and Q9, goes ON, causing the line to be selected.

Circuit Diagram

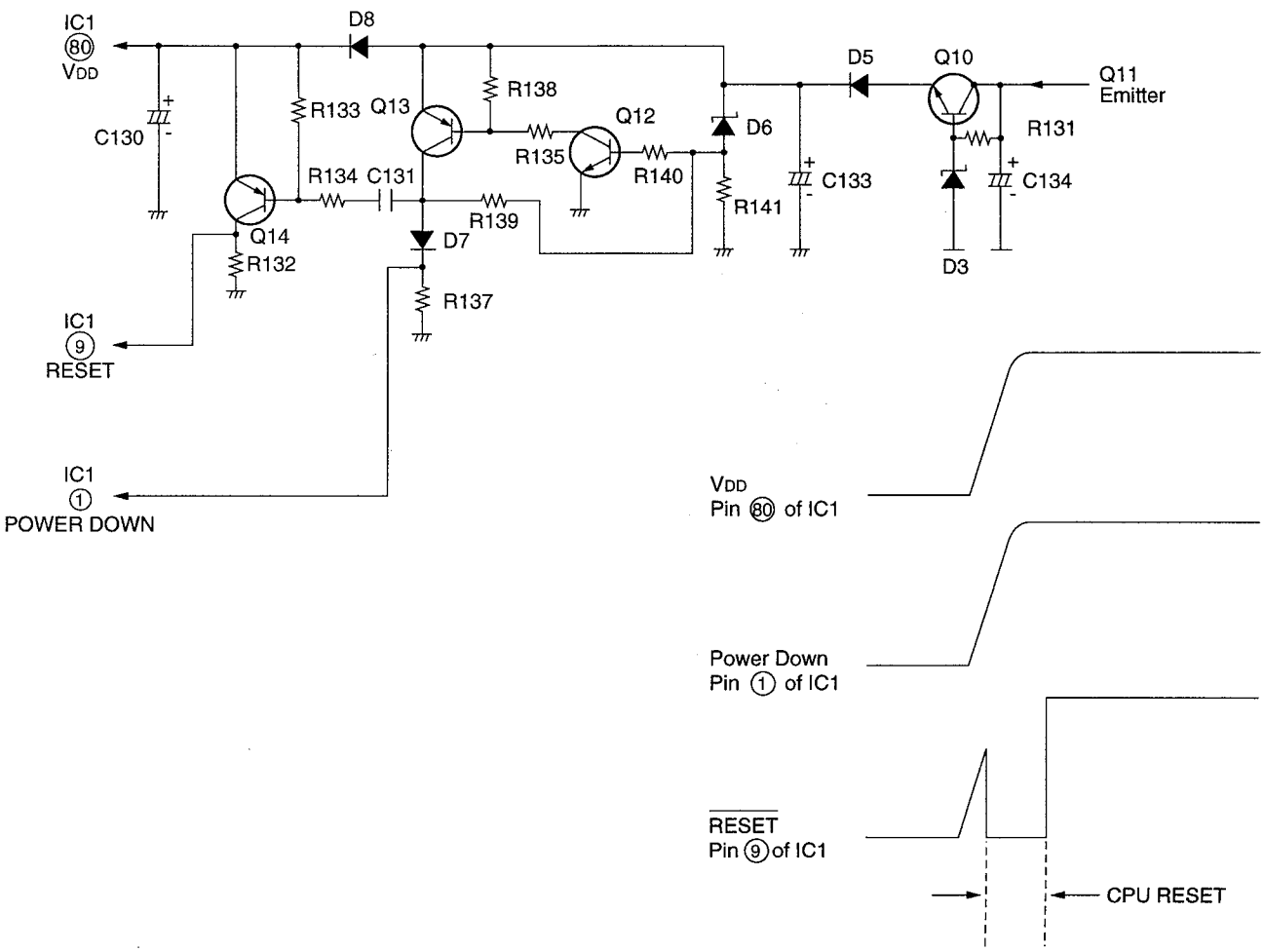


■ INITIALIZATION CIRCUIT

Function:
This circuit is used for initializing the CPU when the AC adaptor is connected.

Circuit Operation:
When the unit is switched ON, then the voltage is shifted by D5, D8 and power is supplied to the CPU.

Circuit Diagram



■ CHARGE DETECT CIRCUIT

Circuit Operation:

•CHARGE MODE

When charging the portable handset on the base unit, CH ID CODES are sent from the CONT terminal to the portable handset, and charging current is supplied to the portable handset from the battery charge contacts via R153 on base unit:

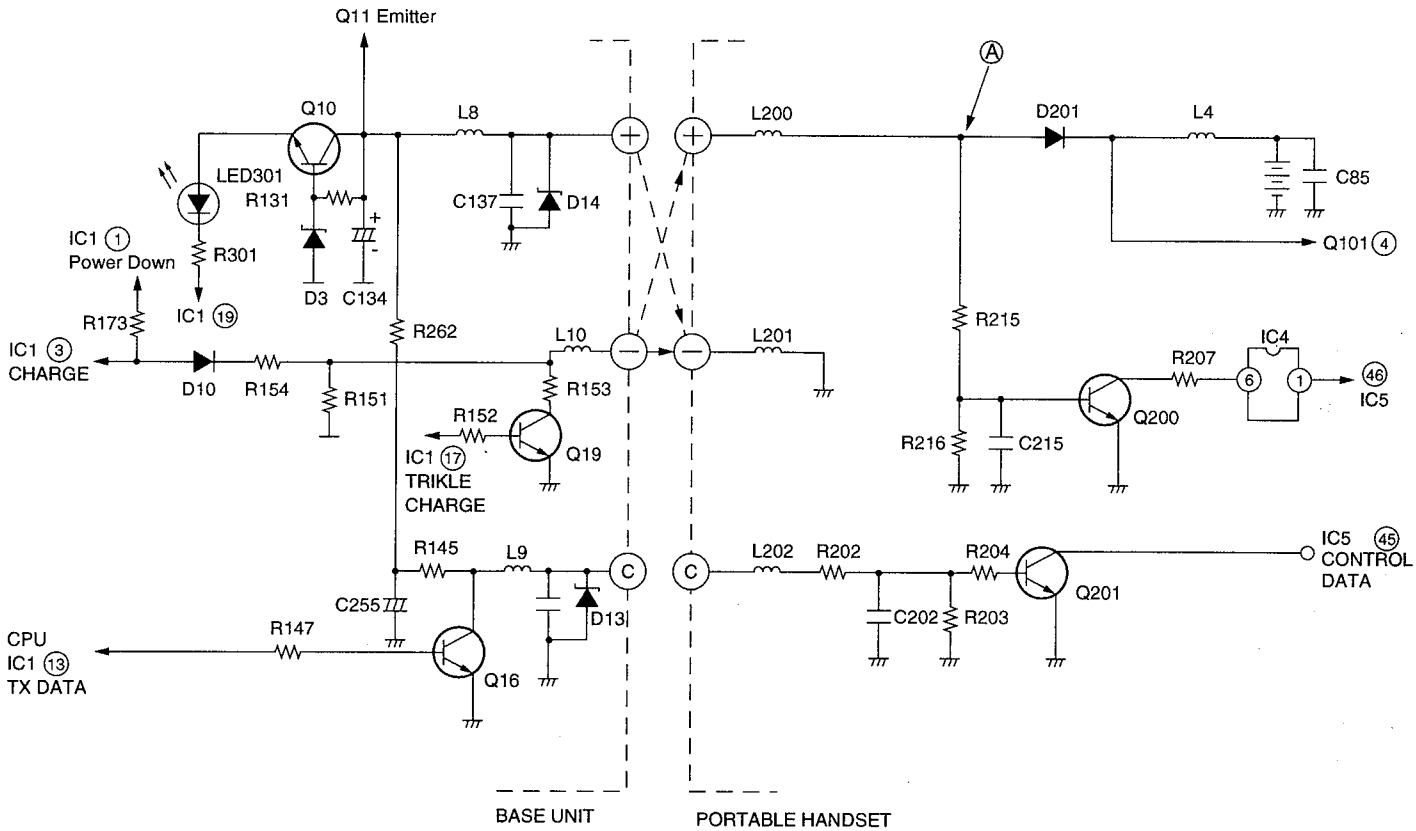
When ⊖ contact on base unit is input to Pin 3 of IC1 (CPU) through D10 and LED301 (CHARGE LED) light is on. When the Ⓐ point on the portable handset is High level, Q200 on portable handset goes on and Pin 6 of IC4 becomes Low, and the pin 1 of IC4 will become low, so pin 46 of IC5 (CPU) becomes low. In this way the CPU on portable handset detects the fact that the battery is charged.

•Set up of the portable handset

When charging the portable handset on the base unit, the data signal is sent from CONT terminal to portable handset. The Q16 switching is affected by Pin 13 of IC1 on base unit, the sending data are CH data, ID code, tone or pulse mode data etc. The data signal is sent to Pin 45 of IC5 (CPU) via Q201 on portable handset.

While charging these data continue to be sent, the CPU of portable handset operates independent of whether power switch is turned ON or OFF, and these data are received by the CPU.

Circuit Diagram

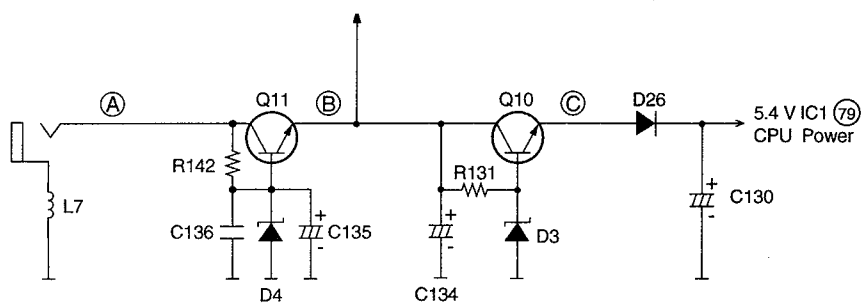


■ POWER SUPPLY CIRCUIT

Function:
Power from the AC adaptor passes through a 2-stage regulating block consisting of Q11 and Q10 and provides system voltages of 5.4 and 9 V.

Circuit Operation:
Power from the AC adaptor is supplied directly to the plunger. Q11 is a regulated power supply. The voltage at point Ⓑ is regulated to 9 V by the zener voltage of D4→Amp power. Q10 is a regulated power supply. The voltage at point Ⓒ is regulated to 6 V by the zener voltage of D3. The 6 V voltage is dropped by D26 to 5.4 V.

Circuit Diagram

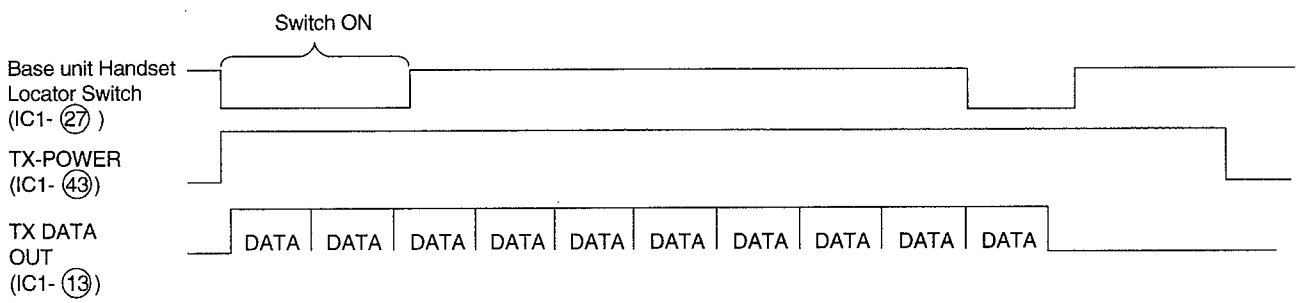


■ CPU OPERATION

1. TEL MODE

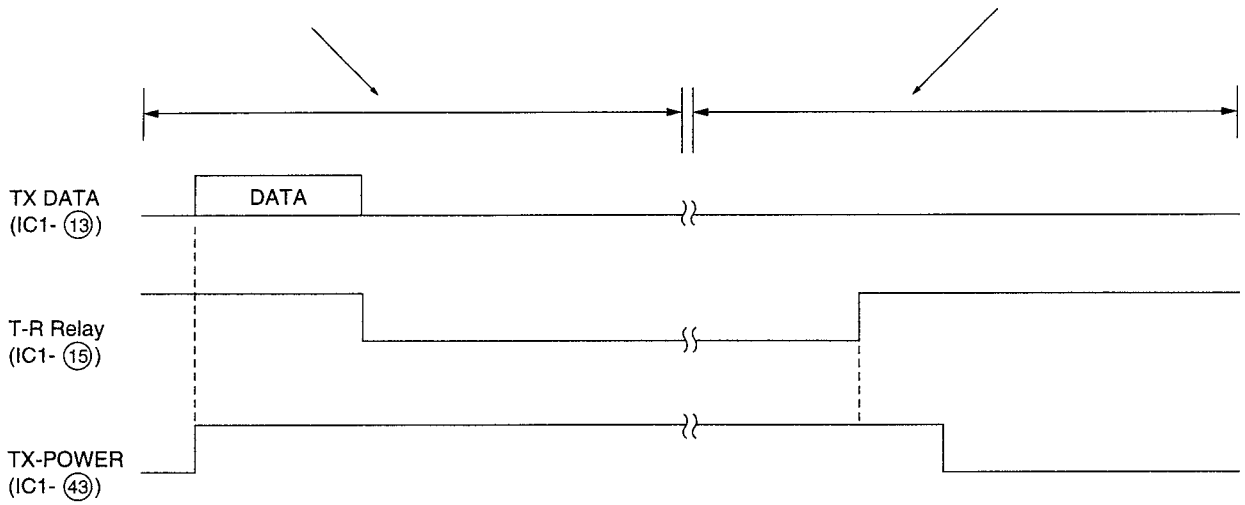
CPU Terminals / Operation Mode	43 TX POW	13 TX DATA	15 TR-RLY	40 BEEP
STANDBY	L	L	H	L
TALK	H	L	L	L
4168CR-B→4168CH-B Paging	H	DATA OUTPUT	H	⊓⊓
4168CH-B→4168CR-B Ring	H	DATA	H	L
4168CH-B→4168CR-B Paging	H	DATA	H	⊓⊓
CHARGE	L	L	H	L
CH Changing (TALK)	H	---	L	L

2. TIMING OF IC1 (CPU) OUTPUT PORT WITH THE BASE UNIT IN HANDSET LOCATOR MODE



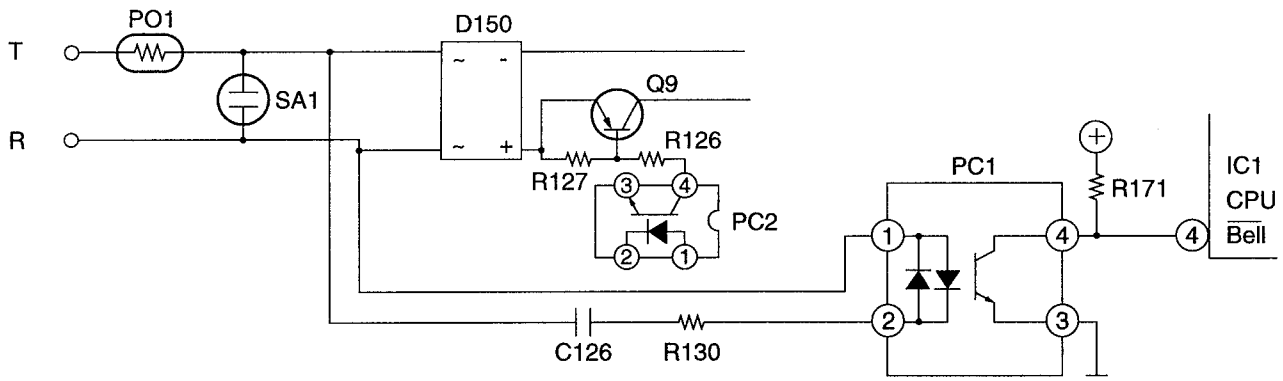
3. WHEN PRESSING THE TALK SWITCH OF THE PORTABLE HANDSET

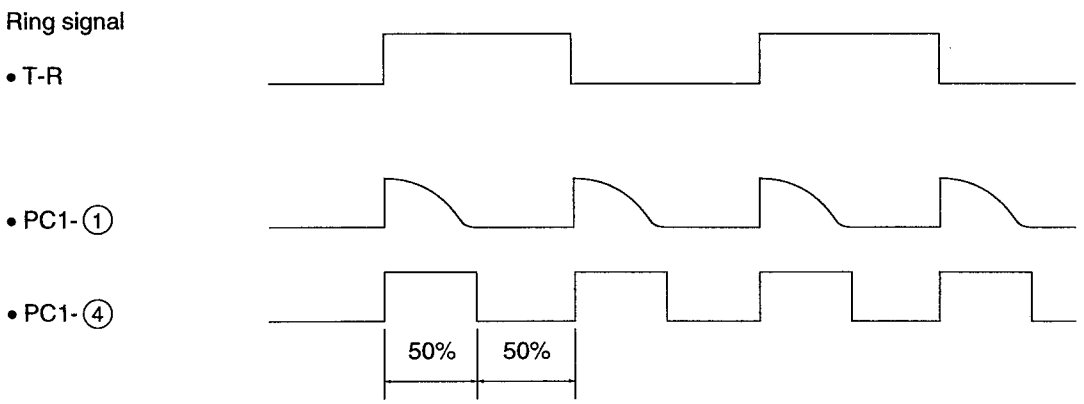
4.THE PORTABLE HANDSET TO OFF



5. RESONANCE PREVENTION CIRCUIT

Circuit Diagram



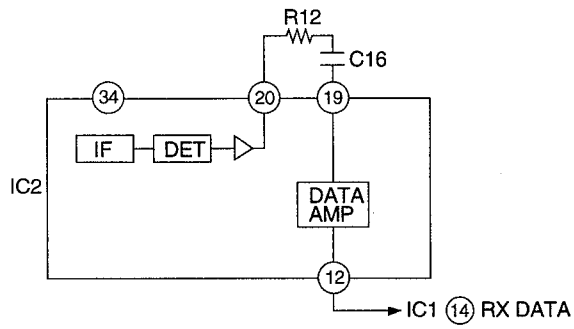


Make/break ratio when dialing with the Portable handset: 40%: 60%
High/low ratio upon ring signal: 50%: 50%
Therefore, if the low/high ratio is greater than 45% at IC1- 4 (CPU), it is judged as a ring signal.

6. EXPLANATION OF THE RECEIVE CIRCUIT

6-1. Signal Flow

Circuit Diagram



In area where the transmission power from the portable handset is extremely weak, noise is superimposed on the data and the chance of an error can become extremely great upon reception of the data. To help prevent this, the above circuit is used.

7. EXPLANATION OF THE TRANSMIT CIRCUIT

The voice signal or data signal sent to the portable handset is applied to the cathode and the anode of variable capacitor diode D2, as shown in below Fig. 12.

Circuit Diagram

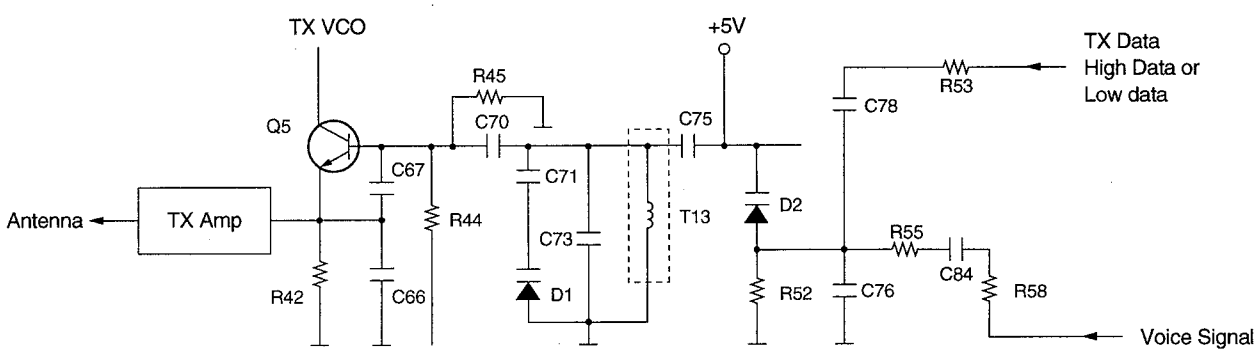


Fig. 12

BLOCK DIAGRAM (KX-T4168CR-B)

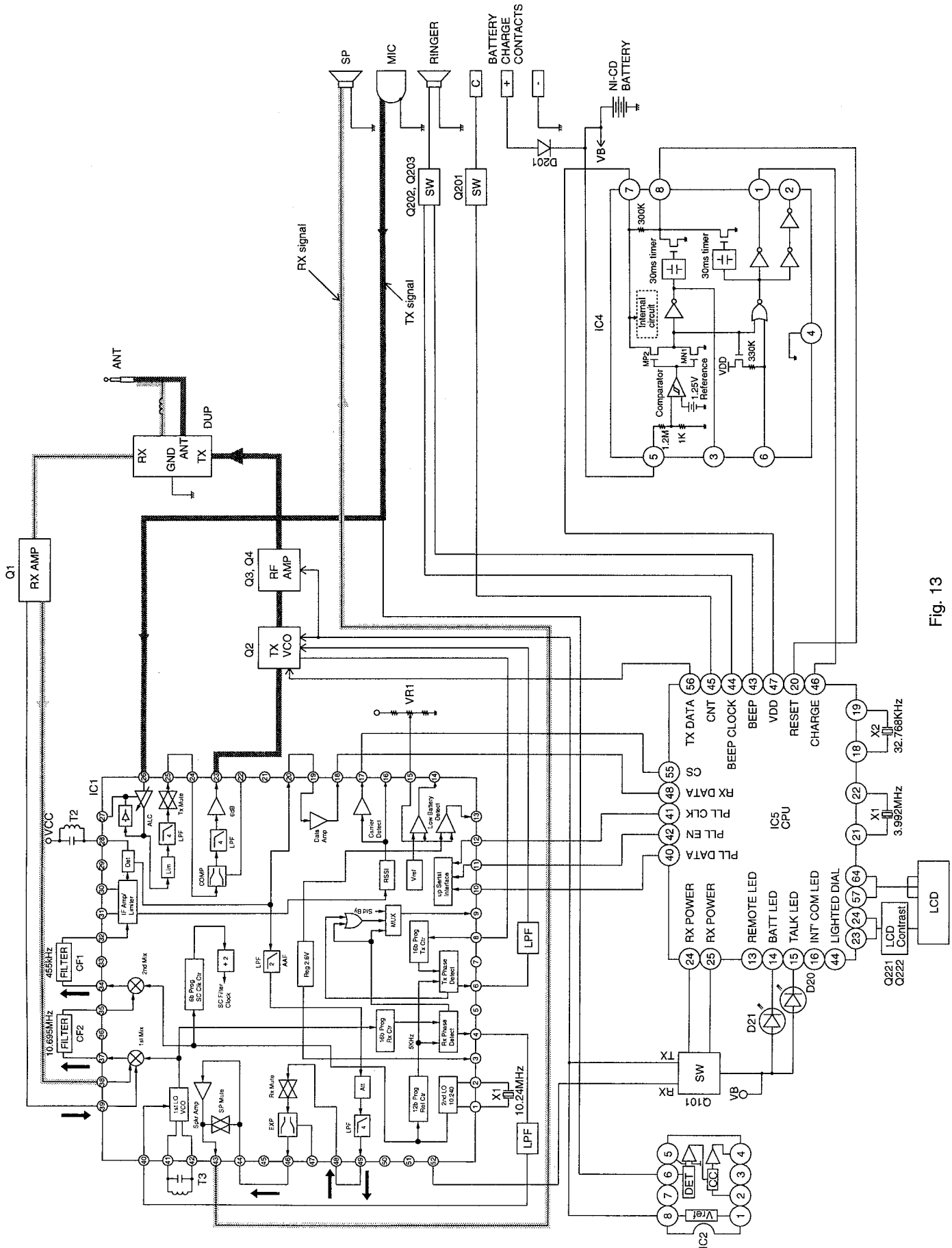


Fig. 13

NEW CIRCUIT OPERATION (KX-T4168CR-B)

■ RECEIVER RF IF CIRCUIT

Circuit Operation:

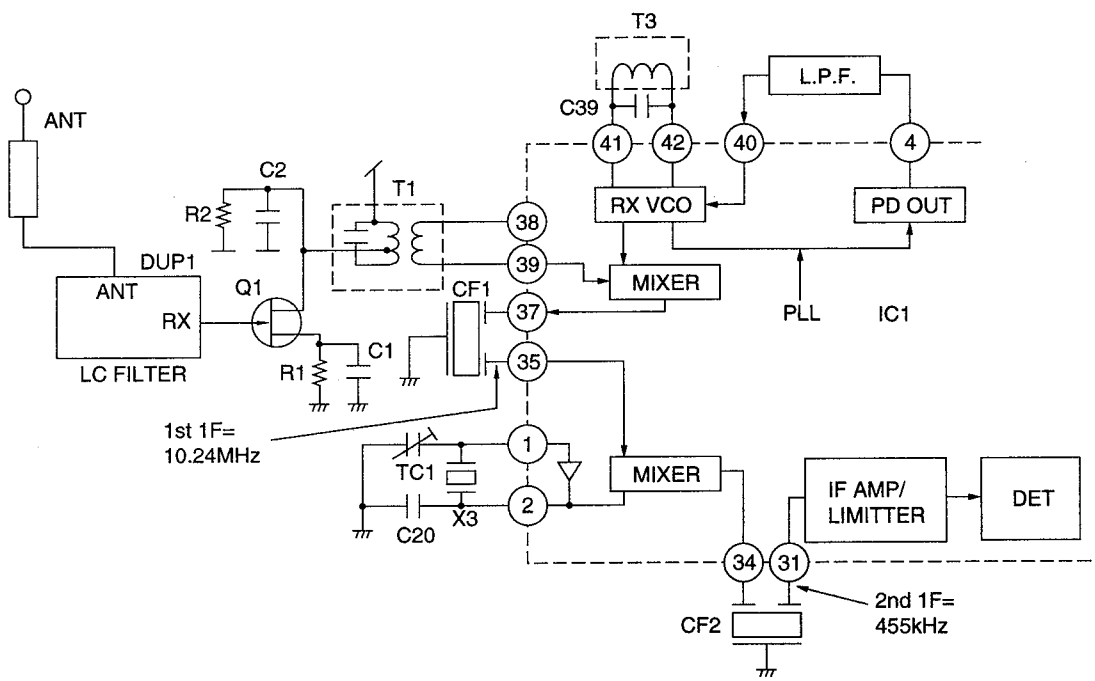
The signal of 46 MHz band (46.61 MHz~46.97 MHz) which is input from ANT is filtered by DUP1, passes through filtered Amp of 46 MHz band at T1 and Q1, and is input to Pin 38 and Pin 39 of IC1.

The RX VCO which oscillates at T3 and IC1 is locked to 1st Local frequency by PLL inside IC1. (PLL is controlled by serial data output from Pin 40, 41 and 42 of IC5.)

An input signal from Pin 38 and 39 of IC1 and 1st Local frequency output from RX VCO are mixed inside IC1, pass through CF1, and 1st IF frequency of 10.24 MHz is generated.

Further, 10.240 MHz oscillated at X3 pass through MIXER inside IC1 and are filtered at CF2 and output 2nd IF 455 kHz.

Circuit Diagram

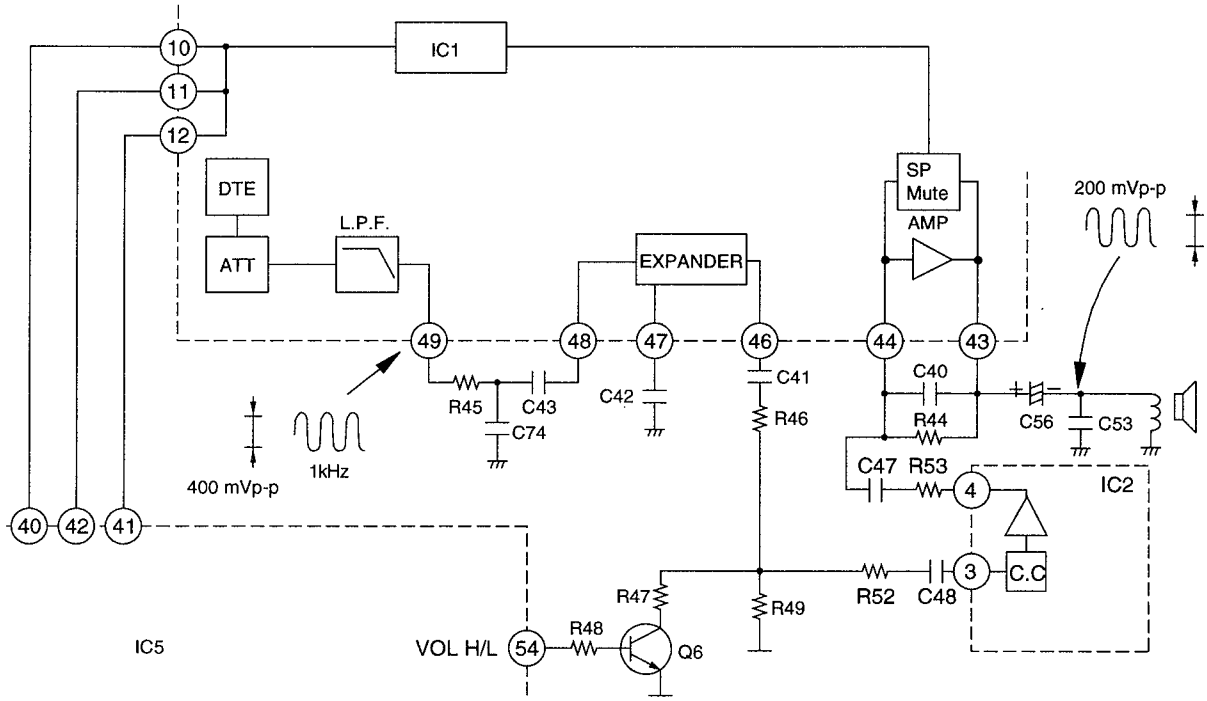


■ RECEIVER SIGNAL CIRCUIT

Circuit Operation:

1. ATT, RX MUTE, MIC MUTE, SP MUTE and PLL CONTROL (CH, REFERENCE, COUNTER) are all controlled by serial data output from Pins 40, 41 and 42 of IC5.
2. A detected signal passes through L.P.F. (fc=4 kHz) inside IC1 and is output to Pin 49.
3. Next, it is input to Pin 48 of IC1, passes through EXPANDER→SP AMP, and is output to speaker.

Circuit Diagram



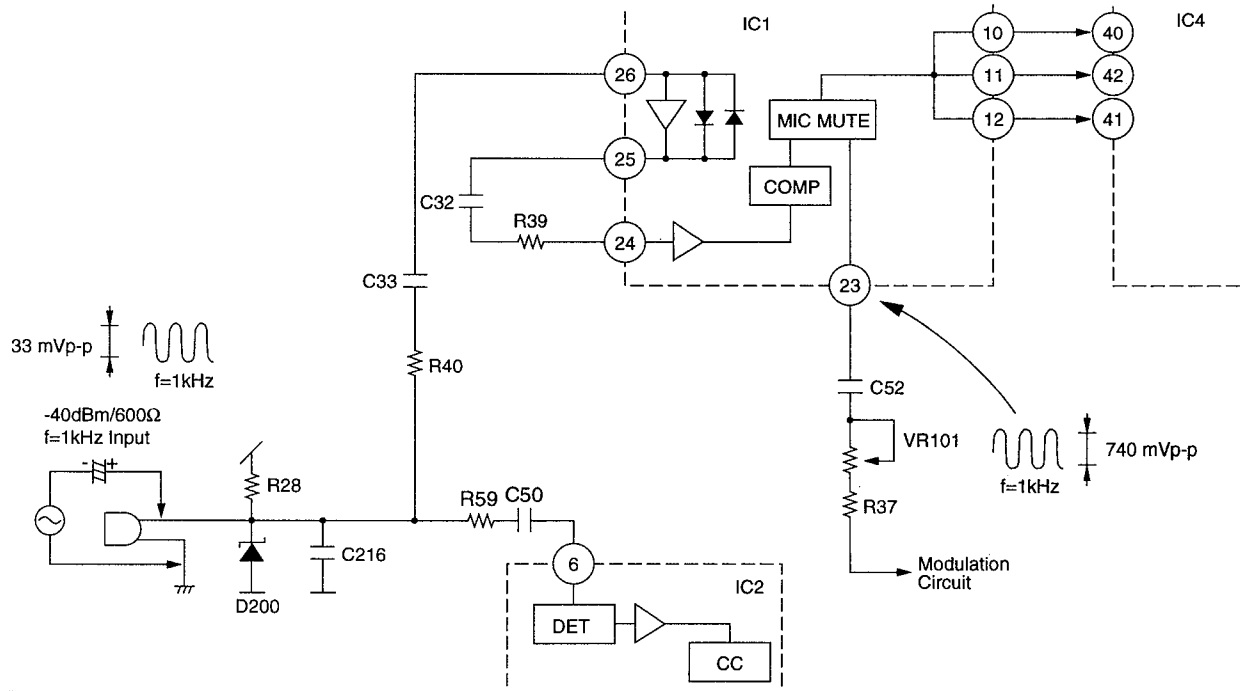
Note: When applying the S.S.G. input level of reception 60 dBμV (3.0 kHz deviation, f=1 kHz) from the antenna, all wave form are measured.

■ TRANSMITTER SIGNAL CIRCUIT

Circuit Operation:

1. Input signal from MIC is input to Pin 26 of IC1, passes through ALC AMP Limitter and L.P.F. (fc=4 kHz), and is output to Pin 25.
2. Next, it passes through C32 and R39 is input to Pin 24 of IC1, then passes through COMPRESSOR and L.P.F. (fc=4k Hz), and is output to Pin 23.
3. An output signal from Pin 23 passes through C52, VR101 and R37, and is input to modulator circuit.

Circuit Diagram



Note:

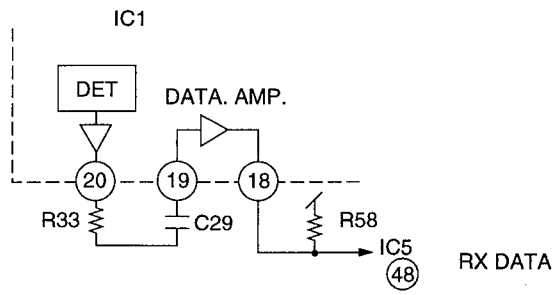
When measuring the waveform, apply the OSC Signal from microphone. (This value is signal level when input electrically from MIC, and if MIC operates soundly, Bias of DC voltage from R28 will be necessary.)

■ RECEIVER DATA CONTROL CIRCUIT

Circuit Operation:

The received signal that is output from Pin 20 of IC1 passes through a low pass filter and is input to Pin 19 of IC1 where the waveform is adjusted. The resulting signal is output from Pin 18 and input to Pin 48 of CPU.

Circuit Diagram



■ BATTERY DETECTOR CIRCUIT

Circuit Operation:

When the battery voltage goes down and the rest of operating time becomes short, the BATT Low/PROG indicator flashes or beeps intermittently.

NORMAL CIRCUIT OPERATION (KX-T4168CR-B)

■ CPU OPERATION

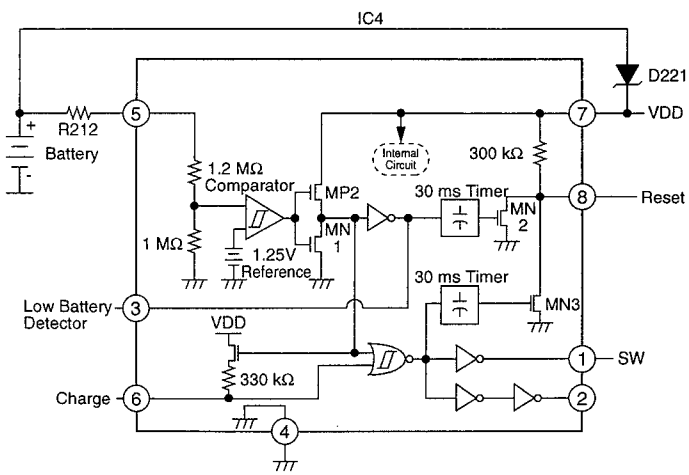
CPU Terminals / Operation Mode	56 TX DATA	30 RX POW	29 TX POW	44 BEEP	28 TALKLED
STANDBY	L	H	H	H	H
TALK	L	L	L	H	L
4168CR-B→4168CH-B Paging	DATA	L	L	⊓⊓⊓⊓	H
4168CH-B→4168CR-B Ring	—	H	L	⊓⊓⊓⊓	FLASHING
4168CH-B→4168CR-B Paging	—	H	L	⊓⊓⊓⊓	H
CHARGE	L	H	H	H	H
During (TALK)	—	L	L	H	L
4168CR-B PULSE DIAL	DATA	L	L	H	L
4168CR-B TONE DIAL	DATA	L	L	H	L

■ RESET CIRCUIT POWER ON/OFF CIRCUIT

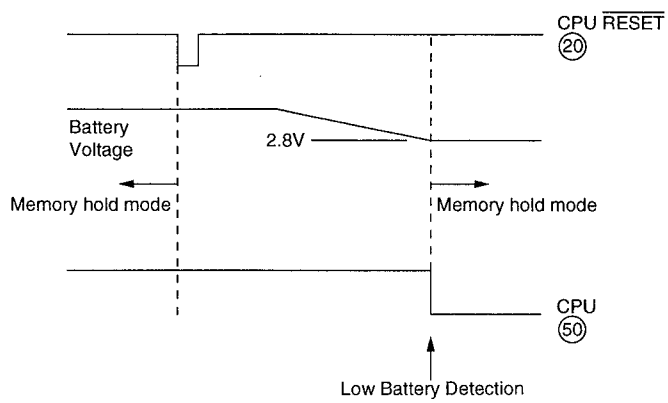
Reset circuit

The reset signal is input to Pin 20 of the CPU by the below circuit.
Once the reset signal is input, the CPU starts to operate from the memory hold mode.
(A) The reset signal will be output when voltage of battery is higher than 2.8 V.

Circuit Diagram



Timing Chart



TROUBLESHOOTING GUIDE

Symptom	Refer to page –.	Unit for repair
The base unit does not respond to a call from portable handset.	18	Base Unit
The base unit does not transmit or the transmit frequency is off.		
The transmit frequency is off.		
The transmit power output is low, and the operating distance between base unit and portable handset is less than normal.		
The reception sensitivity of base unit is low with noise.		
The transmit level is large or small.		
The reception level is large or small.		
The unit does not link.		
The base unit does not ring from the speaker.	58	
The charge indicator does not light.	59	
The IN USE/Charge indicator does not flash.	59	
The beep is not heard from the portable handset.	59	
The movement of Battery Low indicator is wrong.	31	Portable Handset
The base unit does not respond to a call from portable handset. The base unit does not transmit or the transmit frequency is off.		
The transmit frequency is off.		
The transmit power output is low, and the operating distance between base unit and portable handset is less than normal.		
The reception sensitivity of base unit is low with noise.		
Does not link between base unit and portable handset.		
The reception level is large or small.		
The reception level is large or small.		
After power switch is OFF, the portable handset does not become battery save mode.	61	
The beep is not heard from the portable handset.	62	
The TALK indicator does not flash.	62	

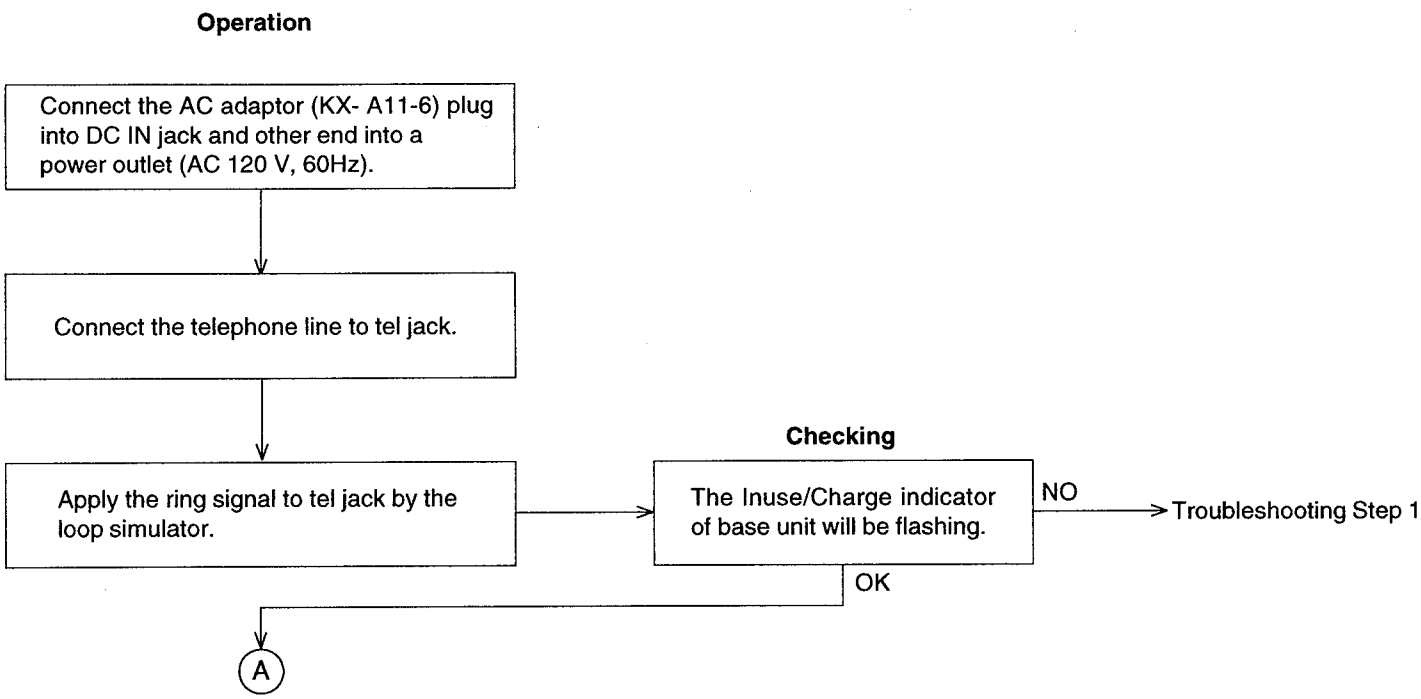
TROUBLESHOOTING GUIDE (KX-T4168CH-B)

Base Unit Condition:

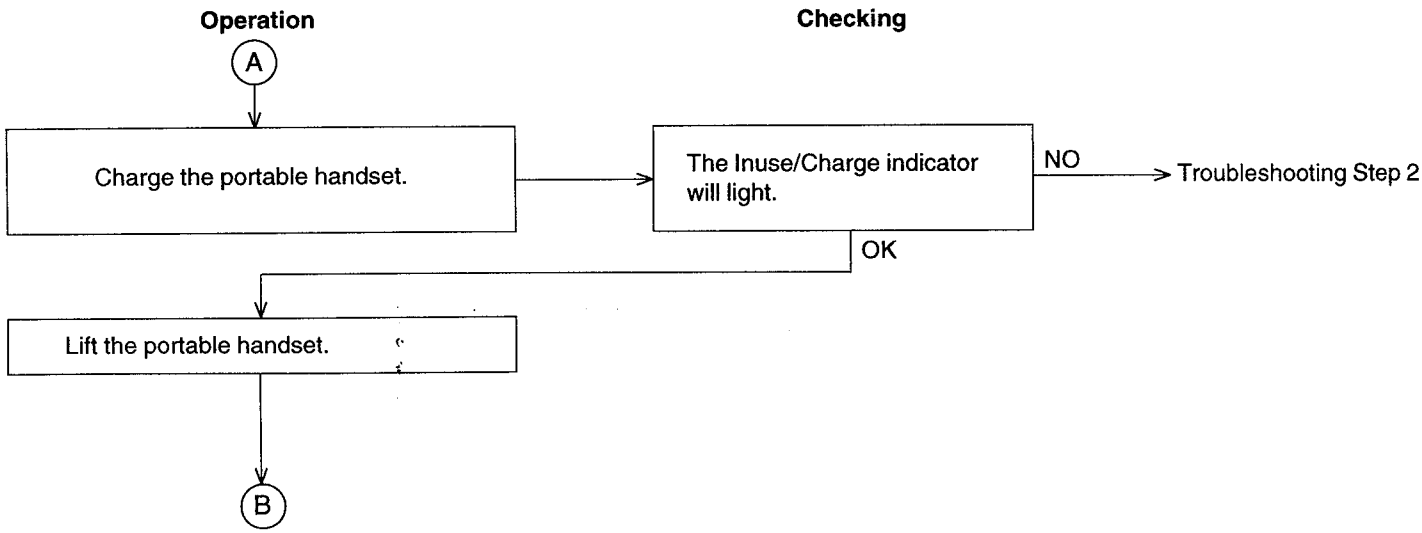
1. Set the Volume/Ringer button to "MAX".
2. Set the dialing mode selector to "Tone".

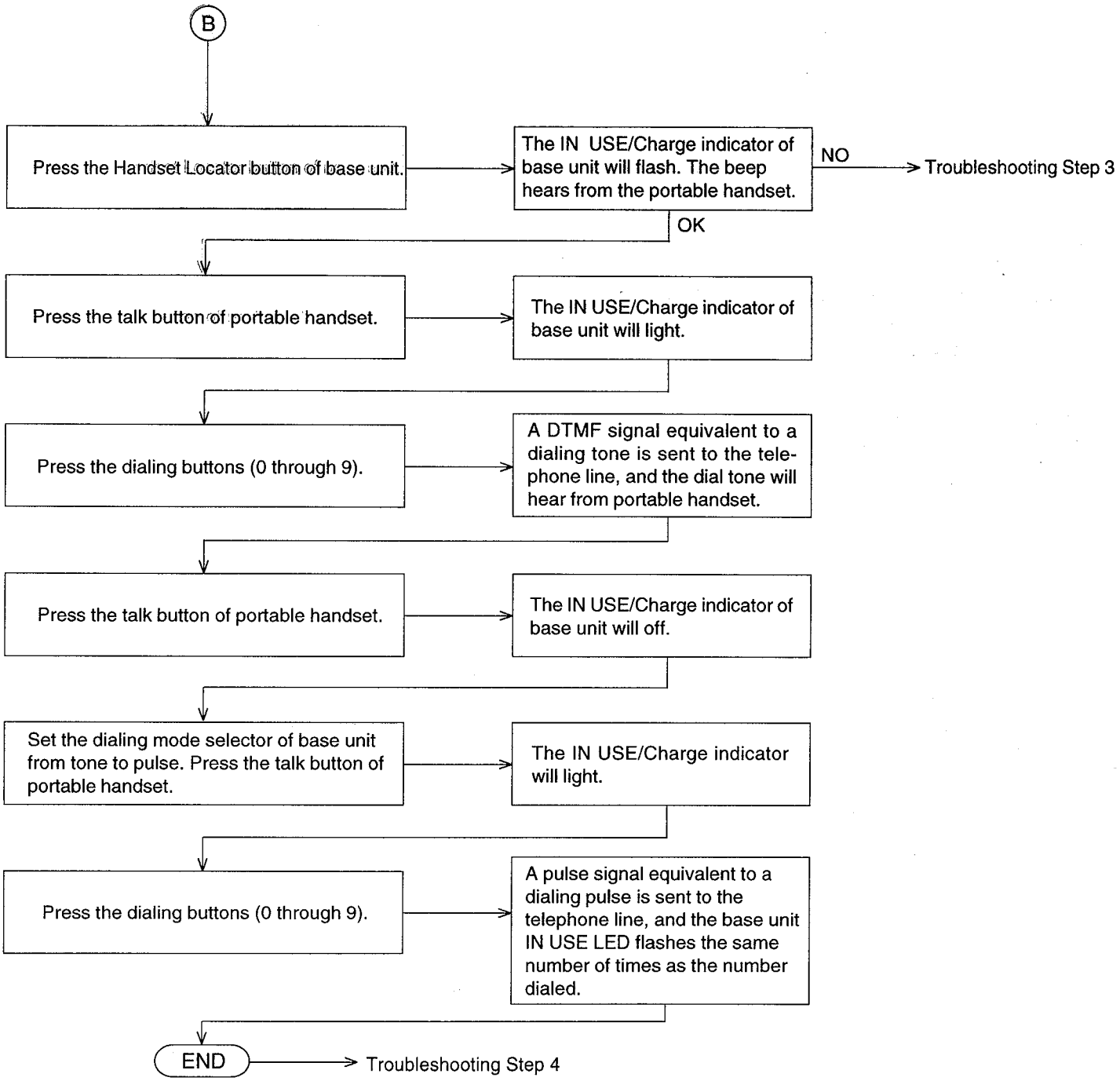
When checking the base unit only

Check the base unit as shown by following below flow chart.


Operation
Connect the AC adaptor (KX- A11-6) plug into DC IN jack and other end into a power outlet (AC 120 V, 60Hz).
Connect the telephone line to tel jack.
Checking
Apply the ring signal to tel jack by the loop simulator.
The Inuse/Charge indicator of base unit will be flashing.
NO
Troubleshooting Step 1
OK
A

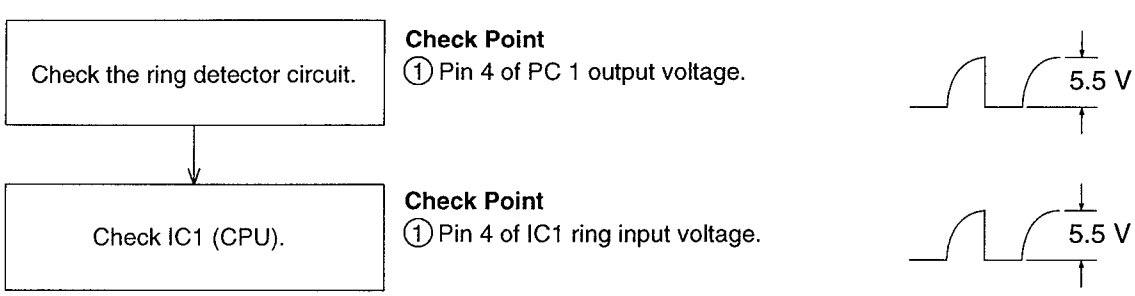
When checking the base unit and portable handset




B
Press the Handset Locator button of base unit.
The IN USE/Charge indicator of base unit will flash. The beep hears from the portable handset.
NO
Troubleshooting Step 3
OK
Press the talk button of portable handset.
The IN USE/Charge indicator of base unit will light.
Press the dialing buttons (0 through 9).
A DTMF signal equivalent to a dialing tone is sent to the telephone line, and the dial tone will hear from portable handset.
Press the talk button of portable handset.
The IN USE/Charge indicator of base unit will off.
Set the dialing mode selector of base unit from tone to pulse. Press the talk button of portable handset.
The IN USE/Charge indicator will light.
Press the dialing buttons (0 through 9).
A pulse signal equivalent to a dialing pulse is sent to the telephone line, and the base unit IN USE LED flashes the same number of times as the number dialed.
END
Troubleshooting Step 4

Troubleshooting Step 1:

The base unit does not ring from the speaker.


Check the ring detector circuit.
Check Point
① Pin 4 of PC 1 output voltage.
5.5 V
Check IC1 (CPU).
Check Point
① Pin 4 of IC1 ring input voltage.
5.5 V

Troubleshooting Step 2: **The charge indicator does not light.**

Check the charge detector circuit.

↓

Check LED301.

Check Point

① Is the ⊖ contact of base unit is low logic level?

Troubleshooting Step 3:

1) The IN USE/CHARGE indicator does not flash.

Check IC1(CPU).

↓

Check LED301.

Check Point

① Is the pin 19 of IC1 (IN USE/Charge output) at a low logic level?

2) The beep is not heard from the portable handset.

Check the data transmition during charge mode.

↓

Check the modulation circuit(D2).

↓

Check the oscillation circuit.

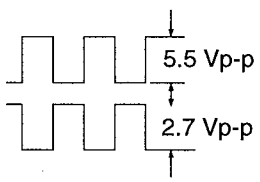
↓

Check the transmitter amplifier.

Check Points

① Pin 13 of IC1 data output voltage.

② Collector of Q16 output voltage.



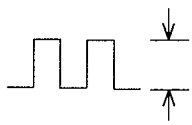
Check during charge mode

Check Point

① Is the base of Q5 (TX VCO) 4 V?

② Is the Pin 5 of IC2 3.2 V?

③ Are the Pins 44, 45 and 46 of IC1 (PLL control)?

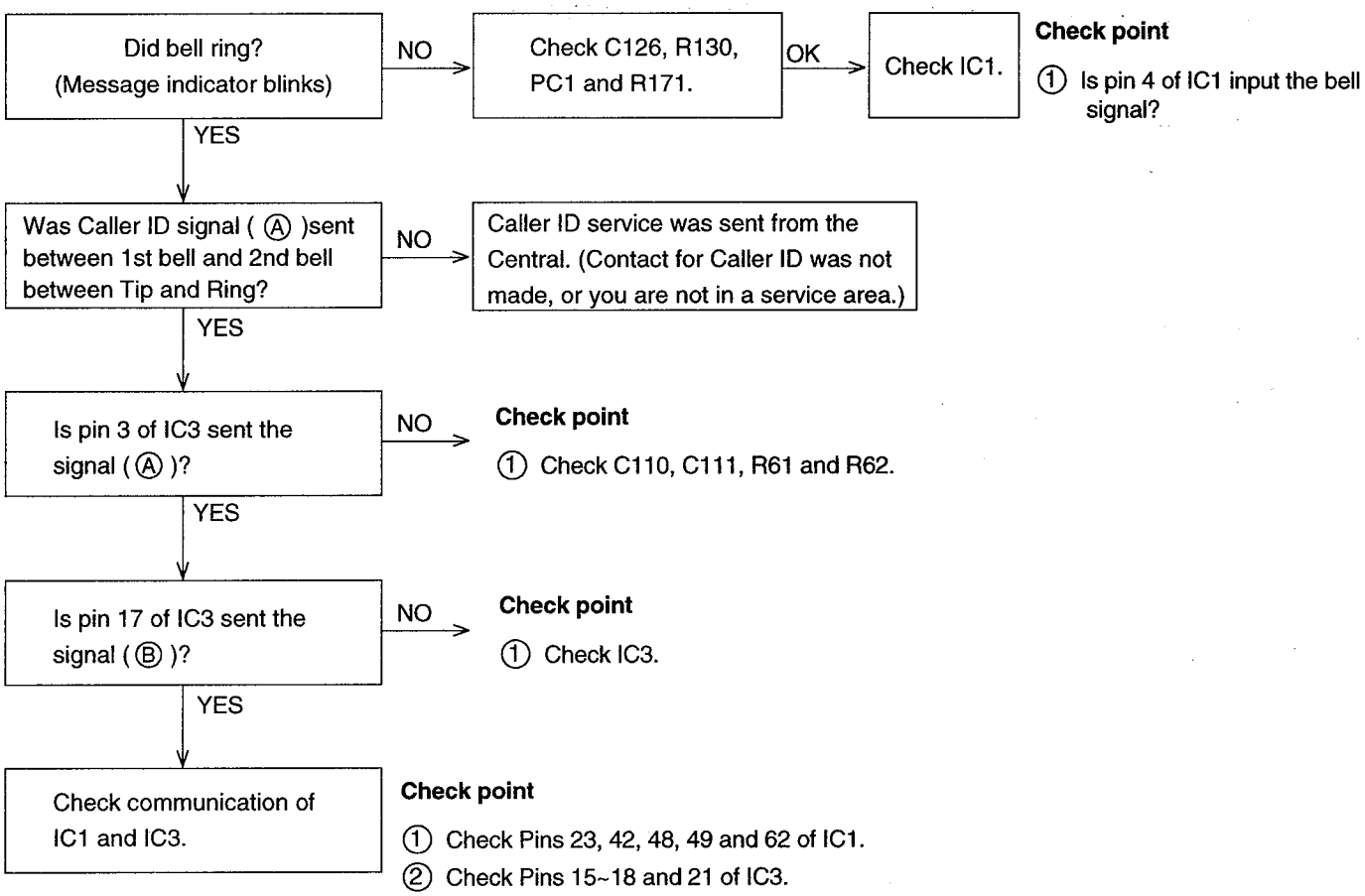


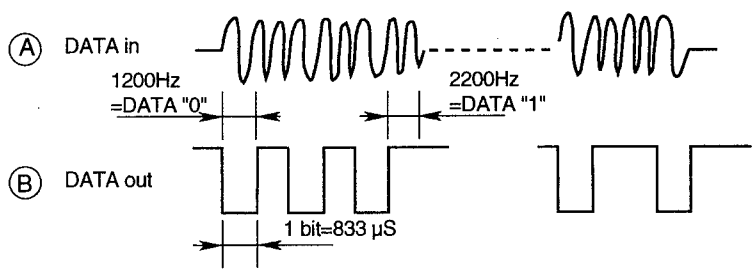
Check Point

① Is the base of Q4 (Final power amplifier) 2 V?

Troubleshooting Step 4:

Call ID Problems.


Did bell ring?
(Message indicator blinks)
NO
Check C126, R130, PC1 and R171.
OK
Check IC1.
Check point
① Is pin 4 of IC1 input the bell signal?
YES
Was Caller ID signal (Ⓐ)sent between 1st bell and 2nd bell between Tip and Ring?
NO
Caller ID service was sent from the Central. (Contact for Caller ID was not made, or you are not in a service area.)
YES
Is pin 3 of IC3 sent the signal (Ⓐ)?
NO
Check point
① Check C110, C111, R61 and R62.
YES
Is pin 17 of IC3 sent the signal (Ⓑ)?
NO
Check point
① Check IC3.
YES
Check communication of IC1 and IC3.
Check point
① Check Pins 23, 42, 48, 49 and 62 of IC1.
② Check Pins 15~18 and 21 of IC3.



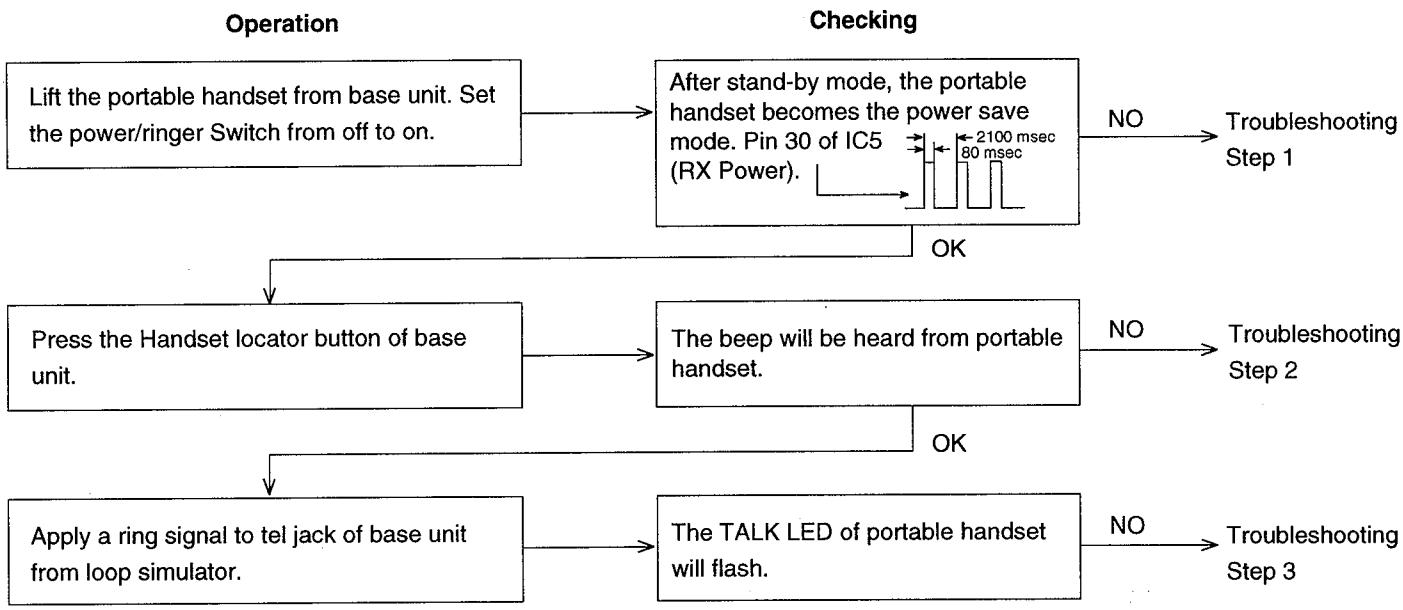
TROUBLESHOOTING GUIDE (KX-T4168CR-B)

Use the right base unit for this troubleshooting.
Charge the battery of the portable handset by the base unit.

Base unit condition:

1. Connect the AC Adaptor (KX-A11-6) plug into DC IN jack and the other end into a power outlet (AC 120 V, 60Hz).
2. Connect the loop simulator (DC 48 V) to tel jack.

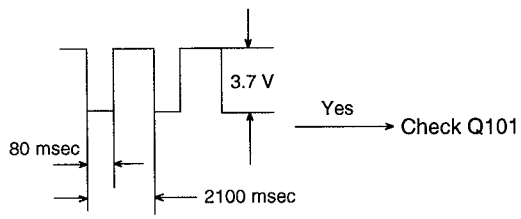
Check the portable handset as shown by following below flow chart.


Operation
Checking
Lift the portable handset from base unit. Set the power/ringer Switch from off to on.
After stand-by mode, the portable handset becomes the power save mode. Pin 30 of IC5 (RX Power).
2100 msec
80 msec
NO
Troubleshooting Step 1
OK
Press the Handset locator button of base unit.
The beep will be heard from portable handset.
NO
Troubleshooting Step 2
OK
Apply a ring signal to tel jack of base unit from loop simulator.
The TALK LED of portable handset will flash.
NO
Troubleshooting Step 3

Troubleshooting Step 1: **After Power SW is OFF, the portable handset does not become battery save mode.**

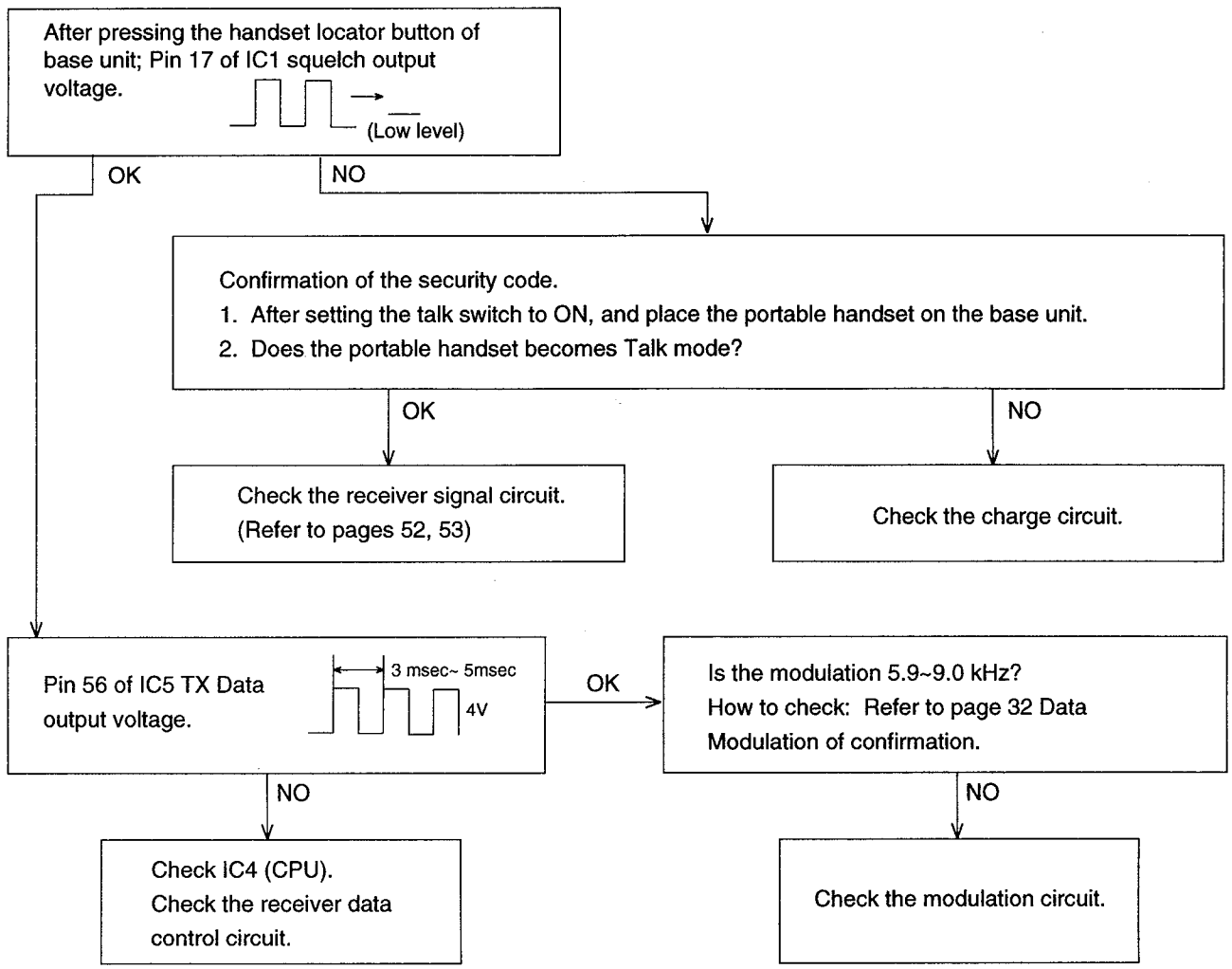
Check point

(1) Pin 30 of IC5
RX power output voltage



Troubleshooting Step 2: **The beep is not heard from the portable handset.**

Check Points

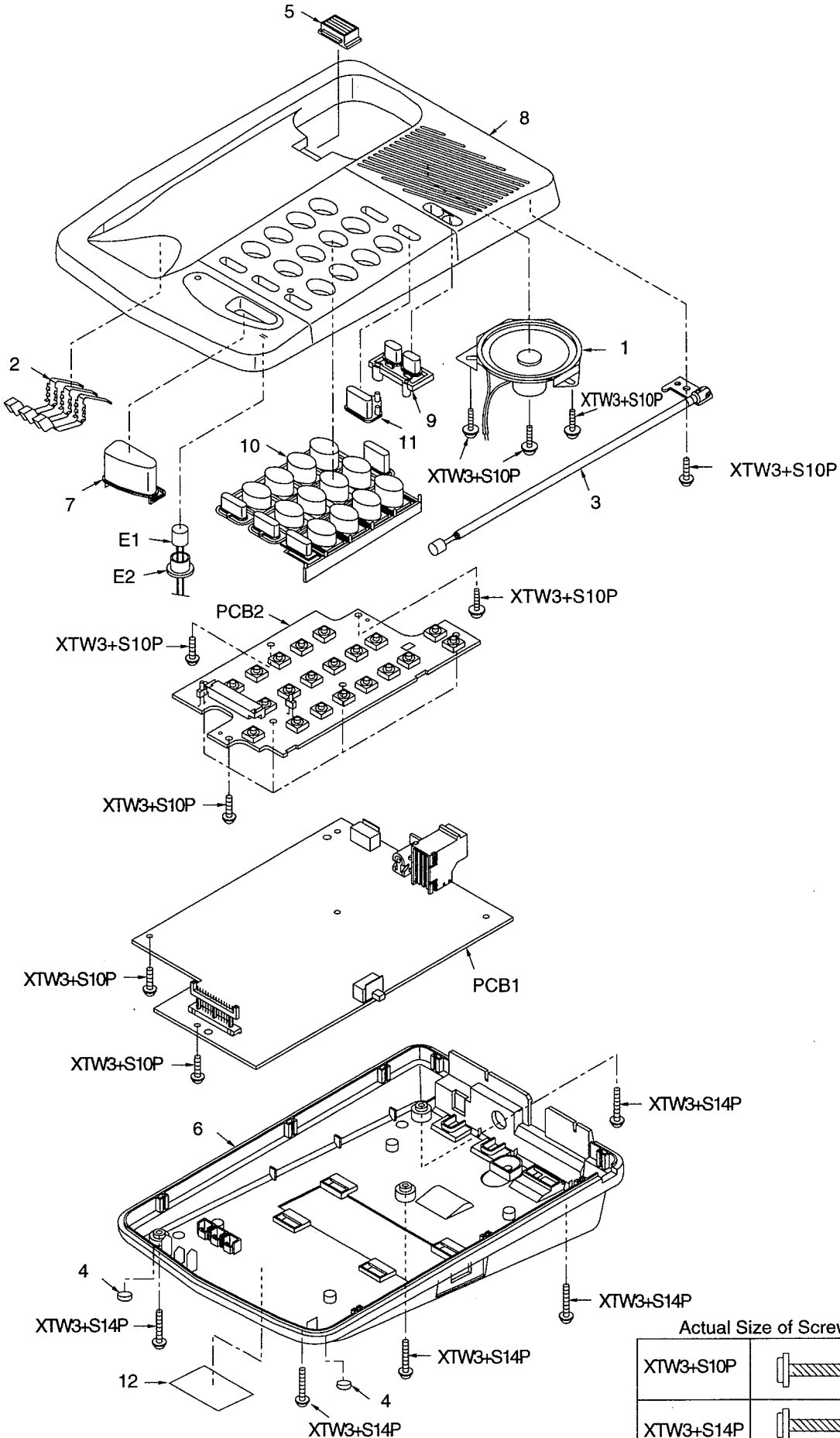

After pressing the handset locator button of base unit; Pin 17 of IC1 squelch output voltage.
(Low level)
OK
NO
Confirmation of the security code.
1. After setting the talk switch to ON, and place the portable handset on the base unit.
2. Does the portable handset becomes Talk mode?
OK
NO
Check the receiver signal circuit. (Refer to pages 52, 53)
Check the charge circuit.
Pin 56 of IC5 TX Data output voltage.
3 msec~ 5msec
4V
OK
Is the modulation 5.9~9.0 kHz?
How to check: Refer to page 32 Data Modulation of confirmation.
NO
NO
Check IC4 (CPU). Check the receiver data control circuit.
Check the modulation circuit.

Troubleshooting Step 3: **The TALK indicator does not flash (Check the data reception).**

Check Point

Check the signal level of receiver data control circuit on page 54.

CABINET AND ELECTRICAL PARTS LOCATION (KX-T4168CH-B)



Actual Size of Screws

XTW3+S10P	
XTW3+S14P	

Fig. 14

CABINET AND ELECTRICAL PARTS LOCATION (KX-T4168CR-B)

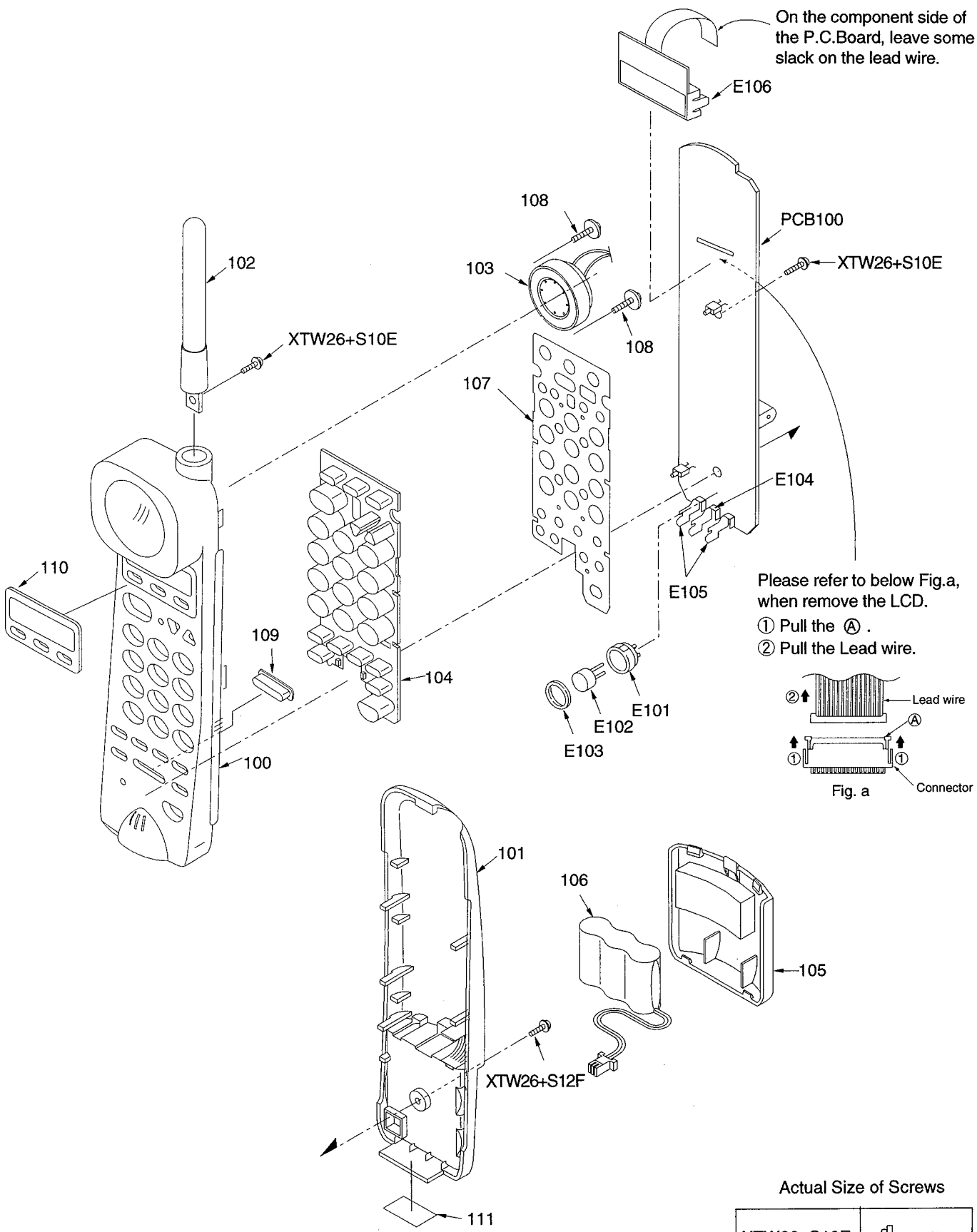


Fig. a

Actual Size of Screws

XTW26+S10E	
XTW26+S12F	

Fig. 15

ACCESSORIES AND PACKING MATERIALS

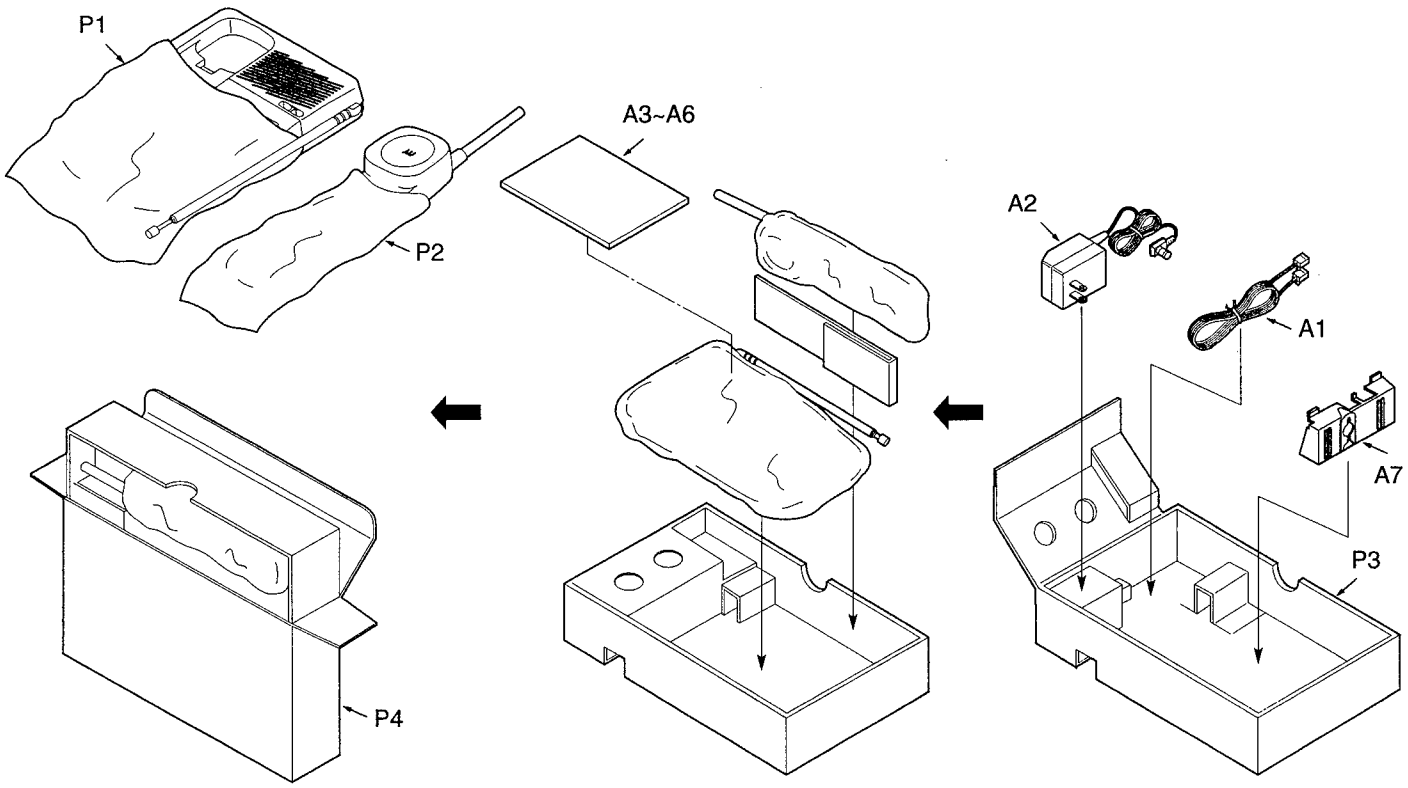


Fig. 16

EXTENSION CABLE CONNECTING METHOD

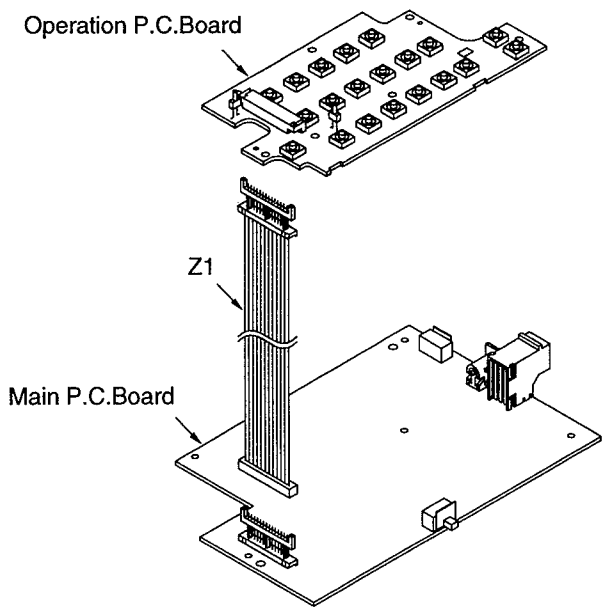


Fig. 17

This replacement parts list is Canada version only. Refer to the simplified manual(cover) for U.S.A. or other areas.

REPLACEMENT PARTS LIST

Model KX-T4168CH-B

Notes:

1. RTL (Retention Time Limited)
   The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. Important safety notice.
   Components identified by the ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The S mark indicates service standard parts and may differ from production parts.
4. RESISTORS & CAPACITORS
   Unless otherwise specified.
   All resistors are in ohms (Ω) K=1000Ω, M=1000KΩ
   All capacitors are in MICRO FARADS (μF) P= μμF
   *Type &Wattage of Resistor
   Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor
Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyester
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

Ref. No.	Part No.	Part Name & Description	Pcs/Set
		CABINET AND ELECTRICAL PARTS	
1	PQAS5P11Z	SPEAKER	1
2	PQJT10100Z	BATTERY TERMINAL	3
3	XEAPQK170D	ANTENNA	1
4	PQHG316Z	RUBBER, LEGS	2
5	PQKE46Y3	HANGER	1
6	PQKF10144S2	LOWER CABINET	1
7	PQBC10187Z2	BUTTON, LOCATOR/INTERCOM	1
8	PQKM10203T3	UPPER CABINET	1
9	PQBX10243Z2	BUTTON, VOLUME	1
10	PQYT10008X2	BUTTON, DIALING 12 KEY etc.	1
11	PQBC10193Z1	BUTTON, MESSAGE	1
12	PQGT12117Z	NAME PLATE	1

Ref. No.	Part No.	Part Name & Description		Pcs/Set
		MAIN PRINTED CIRCUIT BOARD PARTS		
PCB1	PQWP1T4168CH	MAIN, P. C. BOARD ASS'Y (RTL)		1
		(ICS)		
IC1	PQVI4639RA29	IC		1
IC2	AN6185NFA	IC	S	1
IC3	PQVIMT8843AS	IC		1
IC4	PQVILC3518MC	IC	S	1
IC5	PQVISC77655S	IC		1
		(TRANSISTORS)		
Q 1	2SK543	TRANSISTOR(SI)		1
Q 2	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q 4	PQVTMSC2295C	TRANSISTOR(SI)		1
Q 5	2SC2412K	TRANSISTOR(SI)		1
Q 9	2SA1776P	TRANSISTOR(SI) [or 2SA1625]		1
Q10	2SD1991A	TRANSISTOR(SI)		1
Q11	2SD2136	TRANSISTOR(SI)		1
Q12	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q13	2SB709A	TRANSISTOR(SI) [or 2SA116?	S	1
Q14	2SB709A	TRANSISTOR(SI) [or 2SA116?	S	1
Q16	2SD1994A	TRANSISTOR(SI)		1
Q17	2SC1740S	TRANSISTOR(SI) [or 2SC3311 or 2SC3330]		1
Q19	2SC1740S	TRANSISTOR(SI) [or 2SC3311 or 2SC3330]		1
Q20	2SC1740S	TRANSISTOR(SI) [or 2SC3311 or 2SC3330]		1
Q21	PQVTFB1A4M	TRANSISTOR(SI)	S	1
Q22	UN5213	TRANSISTOR(SI)	S	1
Q201	UN5213	TRANSISTOR(SI)	S	1
Q202	PQVTFB1A4M	TRANSISTOR(SI)	S	1
Q203	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q204	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q205	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q206	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q207	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
		(DIODES)		
D 1	PQVD1SV145	DIODE(SI)	S	1
D 2	MA840ATAKU	DIODE(SI)		1
D 3	MA4062	DIODE(SI)	S	1
D 4	MA4100	DIODE(SI)	S	1
D 5	1SS120	DIODE(SI)	S	1
D 6	MA4047	DIODE(SI)		1
D 7	1SS120	DIODE(SI)	S	1
D 8	1SS120	DIODE(SI)	S	1
D10	1SS120	DIODE(SI)	S	1
D11	1SS120	DIODE(SI)	S	1
D12	MA4300	DIODE(SI)		1
D13	MA4300	DIODE(SI)		1
D14	MA4300	DIODE(SI)		1

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Ref. No.	Part No.	Part Name & Description		Pcs/Set
D15	1SS120	DIODE(SI)	S	1
D16	1SS120	DIODE(SI)	S	1
D19	1SS120	DIODE(SI)	S	1
D21	1SS120	DIODE(SI)	S	1
D22	1SS120	DIODE(SI)	S	1
D23	1SS120	DIODE(SI)	S	1
D26	1SS120	DIODE(SI)	S	1
D30	1SS120	DIODE(SI)	S	1
D31	1SS120	DIODE(SI)	S	1
D150	PQVDS1ZB40F1	DIODE(SI)		1
D201	1SS120	DIODE(SI)	S	1
D900	1SS120	DIODE(SI)	S	1
D901	1SS120	DIODE(SI)	S	1
D902	1SS120	DIODE(SI)	S	1
D903	1SS120	DIODE(SI)	S	1
D904	1SS120	DIODE(SI)	S	1
D905	1SS120	DIODE(SI)	S	1
		(COILS AND TRSNSFORMERS)		
L1	PQLQZK1R5K	COIL		1
L3	PQLQXFR82K	COIL	S	1
L4	PQLQXFR82K	COIL	S	1
L6	PQLQXF1R2K	COIL	S	1
L7	PQLQXF1R2K	COIL	S	1
L8	ELEPK330KA	COIL	S	1
L9	ELEPK330KA	COIL	S	1
L10	ELEPK330KA	COIL	S	1
L11	PQLQZM2R2K	COIL		1
T1	PQLA7A34	COIL		1
T2	PQLI2B201	I.F. TRANSFORMER		1
T3	PQLA7A20	COIL		1
T7	PQLT8F3A	TRANSFORMER		1 ⚠
T8	PQLT8F3A	TRANSFORMER		1 ⚠
T11	PQLA7A9	COIL		1
T13	PQLA7A22	COIL		1
		(CRYSTALS)		
X1	PQVCJ7952N5Z	CRYSTAL OSCILLATOR		1
X2	PQVCJ10240C5	CRYSTAL OSCILLATOR		1
X900	PQVCJ3581N9Z	CRYSTAL OSCILLATOR		1
		(PHOTO COUPLERS)		
PC1	PQVIPC814K	PHOTO ELECTRIC TRANSDUCER	S	1 ⚠
PC2	PQVITLP627	PHOTO ELECTRIC TRANSDUCER	S	1 ⚠
PC3	PQVIPC817CD	PHOTO ELECTRIC TRANSDUCER	S	1 ⚠

Ref. No.	Part No.	Part Name & Description		Pcs/Set
		(CERAMIC FILTERS)		
CF1	RVFSFE107MSR	CERAMIC FILTER	S	1
CF2	PQVFCFH455F1	CERAMIC FILTER	S	1
		(SWITCHES)		
S1	PQSS2A27W	SWITCH, DIALING MODE		1
S2	PQSS3A17W	SWITCH, RINGER		1
		(CONNECTOR)		
CNT1	PQJP14A55Z	CONNECTOR, 14 PIN		1
		(JACK)		
JJ1	PQJJ2HA2Z	JACK, TELEPHONE LINE/DC IN		1
		(VARIABLE RESISTORS)		
VR1	EVNDXAA03B55	VARIABLE RESISTOR. 500KΩ		1
VR2	EVNDXAA03B15	VARIABLE RESISTOR. 100KΩ		1
VR3	EVNDXAA03B54	VARIABLE RESISTOR. 50KΩ		1
		(OTHERS)		
CT1	ECRLA030E53	TRIMMER CAPACITOR	S	1
DUP1	PQVFDX4649B2	CERAMIC FILTER		1
E1	PQJM122Z	MICROPHONE		1
E2	PQMG10004Z	RUBBER, MIC COVER		1
P01	PQRPAR390N	THERMISTOR	S	1
SA1	PQVDDSS301L	VARISTOR		1
SA2	PQVDDSA242MU	VARISTOR		1

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Ref. No.	Part No.	Value	Pcs/Set
		(RESISTORS)	
R 1	PQ4R10XJ101	100	1
R 2	Not Used		
R 3	ERJ3GEYJ683	68K	1
R 4	ERJ3GEYJ104	100K	1
R 5	Not Used		
R 6	ERDS2TJ103	10K	1
R 7	ERJ3GEYJ824	820K	1
R 8	ERJ3GEYJ394	390K	1
R 9	ERJ3GEYJ153	15K	1
R11	ERDS2TJ472	4.7K	1
R12	ERJ3GEYJ333	33K	1
R13	ERJ3GEYJ153	15K	1
R14	ERJ3GEYJ104	100K	1
R15	ERJ3GEYJ102	1K	1
R16	ERJ3GEYJ333	33K	1
R17	Not Used		
R18	ERJ3GEYJ152	1.5K	1
R19	ERJ3GEYJ223	22K	1
R21	ERJ3GEYJ333	33K	1
R22	Not Used		
R23	ERJ3GEYJ103	10K	1
R24	ERJ3GEYJ000	0	1
R25	ERJ3GEYJ224	220K	1
R26	ERJ3GEYJ153	15K	1
R27	ERDS2TJ683	68K	1
R30	ERJ3GEYJ823	82K	1
R39	ERJ3GEYJ103	10K	1
R40	ERJ3GEYJ224	220K	1
R41	ERJ3GEYJ220	22	1
R42	ERJ3GEYJ561	560	1
R43	ERJ3GEYJ104	100K	1
R44	PQ4R10XJ223	22K	1
R45	ERJ3GEYJ223	22K	1
R46	ERJ3GEYJ683	68K	1
R47	PQ4R10XJ683	68K	1
R48	PQ4R10XJ104	100K	1
R49	ERJ3GEYJ682	6.8K	1
R50	ERJ3GEYJ222	2.2K	1
R51	ERJ3GEYJ103	10K	1
R52	ERJ3GEYJ473	47K	1
R53	ERJ3GEYJ000	0	1
R54	PQ4R10XJ274	270K	1
R55	ERJ3GEYJ104	100K	1
R56	ERJ3GEYJ000	0	1
R57	ERJ3GEYJ474	470K	1
R58	ERDS2TJ474	470K	1
R59	ERJ3GEYJ221	220	1
R61	PQ4R10XJ394	390K	1
R62	PQ4R10XJ394	390K	1
R77	ERJ3GEYJ103	10K	1
R88	ERJ3GEYJ105	1M	1
R93	ERJ3GEYJ000	0	1
R94	ERJ3GEYJ104	100K	1

Ref. No.	Part No.	Value	Pcs/Set
R98	ERJ3GEYJ472	4.7K	1
R99	ERJ3GEYJ472	4.7K	1
R100	ERJ3GEYJ104	100K	1
R101	ERJ3GEYJ104	100K	1
R102	ERJ3GEYJ272	2.7K	1
R103	ERDS2TJ332	3.3K	1
R104	ERDS2TJ104	100K	1
R105	ERJ3GEYJ104	100K	1
R106	ERJ3GEYJ104	100K	1
R107	ERJ3GEYJ124	120K	1
R108	ERJ3GEYJ563	56K	1
R109	ERJ3GEYJ273	27K	1
R110	ERJ3GEYJ153	15K	1
R111	ERJ3GEYJ000	0	1
R112	ERJ3GEYJ000	0	1
R113	ERJ3GEYJ000	0	1
R114	ERJ3GEYJ392	3.9K	1
R115	ERJ3GEYJ000	0	1
R116	ERJ3GEYJ000	0	1
R117	ERJ3GEYJ000	0	1
R118	ERJ3GEYJ000	0	1
R119	PQ4R10XJ104	100K	1
R120	PQ4R10XJ000	0	1
R121~124	Not Used		
R125	ERDS2TJ472	4.7K	1
R126	ERDS2TJ122	1.2K	1
R127	PQ4R10XJ104	100K	1
R128	ERJ3GEYJ473	47K	1
R129	ERJ3GEYJ681	680	1
R130	ERDS2TJ473	47K	1
R131	PQ4R10XJ102	1K	1
R132	ERJ3GEYJ104	100K	1
R133	ERJ3GEYJ104	100K	1
R134	ERDS2TJ104	100K	1
R135	ERJ3GEYJ184	180K	1
R136	Not Used		
R137	ERJ3GEYJ104	100K	1
R138	ERJ3GEYJ104	100K	1
R139	ERJ3GEYJ823	82K	1
R140	ERJ3GEYJ103	10K	1
R141	ERJ3GEYJ103	10K	1
R142	ERDS2TJ102	1K	1
R143	Not Used		
R144	Not Used		
R145	ERDS2TJ332	3.3K	1
R146	Not Used		
R147	ERDS2TJ473	47K	1
R148	Not Used		
R149	ERDS2TJ472	4.7K	1
R150	ERDS1TJ330	33	1
R151	ERDS2TJ331	330	1
R152	ERDS2TJ472	4.7K	1
R153	ERDS2TJ181	180	1
R154	ERDS2TJ103	10K	1
R155	ERJ3GEYJ000	0	1
R156	Not Used		
R157	ERJ3GEYJ102	1K	1
R161	ERDS2TJ472	4.7K	1

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Ref. No.	Part No.	Value	Pcs/Set
R162	PQ4R10XJ104	100K	1
R163	PQ4R10XJ472	4.7K	1
R164	PQ4R10XJ563	56K	1
R165	ERJ3GEYJ103	10K	1
R166	ERDS2TJ103	10K	1
R170	ERJ3GEYJ393	39K	1
R171	ERJ3GEYJ123	12K	1
R172	Not Used		
R173	ERDS2TJ224	220K	1
R174	ERJ3GEYJ104	100K	1
R180	PQ4R10XJ391	390	1
R181	PQ4R10XJ820	82	1
R200	ERJ3GEYJ682	6.8K	1
R201	ERJ3GEYJ682	6.8K	1
R202	ERJ3GEYJ273	27K	1
R203	ERJ3GEYJ683	68K	1
R204	ERJ3GEYJ821	820	1
R205	ERJ3GEYJ225	2.2M	1
R206	ERJ3GEYJ275	2.7M	1
R207	ERDS2TJ104	100K	1
R208	ERJ3GEYJ472	4.7K	1
R209	ERJ3GEYJ222	2.2K	1
R210	ERJ3GEYJ183	18K	1
R211	ERJ3GEYJ123	12K	1
R212	ERDS2TJ104	100K	1
R213	ERJ3GEYJ472	4.7K	1
R214	PQ4R10XJ333	33K	1
R215	ERJ3GEYJ104	100K	1
R216	ERDS2TJ103	10K	1
R217	ERJ3GEYJ104	100K	1
R218	ERJ3GEYJ153	15K	1
R219	ERJ3GEYJ155	1.5M	1
R220	ERJ3GEYJ333	33K	1
R221	ERJ3GEYJ393	39K	1
R222	ERJ3GEYJ333	33K	1
R223	ERJ3GEYJ222	2.2K	1
R224	ERJ3GEYJ684	680K	1
R225	ERJ3GEYJ820	82	1
R226	ERJ3GEYJ272	2.7K	1
R227	ERJ3GEYJ274	270K	1
R228	ERJ3GEYJ104	100K	1
R229	ERJ3GEYJ103	10K	1
R230	ERDS2TJ103	10K	1
R231	ERJ3GEYJ000	0	1
R232	ERJ3GEYJ684	680K	1
R233	ERJ3GEYJ222	2.2K	1
R234	ERDS2TJ151	150	1
R235	Not Used		
R236	ERJ3GEYJ563	56K	1
R237	ERDS2TJ331	330	1
R238	ERJ3GEYJ103	10K	1
R262	PQ4R10XJ101	100	1
R263	ERJ3GEYJ394	390K	1
R306	ERJ3GEYJ000	0	1
R307	Not Used		
R308	ERJ3GEYJ394	390K	1
R309	ERJ3GEYJ103	10K	1

Ref. No.	Part No.	Value	Pcs/Set
R314	ERJ3GEYJ000	0	1
R900	PQ4R10XJ000	0	1
R901	Not Used		
R902	ERJ3GEYJ104	100K	1
R903	ERJ3GEYJ394	390K	1
R904	ERJ3GEYJ394	390K	1
R905	ERJ3GEYJ823	82K	1
R906	ERJ3GEYJ823	82K	1
R907	ERJ3GEYJ563	56K	1
R908	ERJ3GEYJ563	56K	1
R909	ERJ3GEYJ155	1.5M	1
R910	ERJ3GEYJ474	470K	1
R911	ERJ3GEYJ334	330K	1
R912	ERJ3GEYJ105	1M	1
R913	PQ4R10XJ331	330	1
R914	ERJ3GEYJ392	3.9K	1
R915	ERJ3GEYJ470	47	1
R916	ERJ3GEYJ000	0	1
J1, J17 D907	PQ4R10XJ000	0Ω, JUMPER	3
J2, J4 J5~7 J9 J12~14 J16,J500 JP1	ERJ3GEYJ000	0Ω, JUMPER	11
J10, J11	PQ4R18XJ000	0Ω, JUMPER	2

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Ref. No.	Part No.	Value		Pcs/Set
		(CAPACITORS)		
C 1	PQCUV1H103KB	0.01	S	1
C 2	PQCUV1H103KB	0.01	S	1
C 3	PQCUV1E104MD	0.1		1
C 4	ECEA1AU101	100	S	1
C 5	PQCUV1H103KB	0.01	S	1
C 6	ECEA1HU100	10	S	1
C 7	PQCUV1E104MD	0.1		1
C10	ECUV1H680JCV	68P		1
C11	Not Used			
C12	ECEA1HKSR47	0.47	S	1
C13	ECEA1HKS010	1	S	1
C14	PQCUV1E104MD	0.1		1
C15	Not Used			
C16	PQCUV1E104MD	0.1		1
C17	PQCUV1E104MD	0.1		1
C18	Not Used			
C19	PQCUV1E104MD	0.1		1
C20	PQCUV1E104MD	0.1		1
C21	Not Used			
C22	Not Used			
C23	ECEA1HKS010	1	S	1
C24	ECEA1HU100	10	S	1
C25	ECUV1H100DCV	10P		1
C26	PQCUV1E223KB	0.022		1
C27	ECEA1HKS3R3	3.3	S	1
C28	ECUV1H472KBV	0.0047	S	1
C33	PQCUV1E104MD	0.1		1
C34	ECEA1CKS100	10	S	1
C35	ECEA1HKSR47	0.47	S	1
C36	PQCUV1E104MD	0.1		1
C39	ECUV1H101JCV	100P		1
C40	ECUV1H470JCV	47P		1
C41	PQCUV1E104MD	0.1		1
C42	ECUV1H562KBV	0.0056		1
C43	PQCUV1E104MD	0.1		1
C44~47	Not Used			
C48	PQCUV1E333MD	0.033	S	1
C50	ECUV1H223KBV	0.022	S	1
C51	ECUV1H102KBV	0.001		1
C52	PQCUV1E104MD	0.1		1
C60	PQCUV1H470JC	47P		1
C61	Not Used			
C62	ECUV1H103KBV	0.01	S	1
C63	ECUV1H150JCV	15P		1
C64	ECUV1H470JCV	47P		1
C65	ECUV1H103KBV	0.01	S	1
C66	ECUV1H470JCV	47P		1
C67	ECUV1H680JCV	68P		1
C68	ECUV1H470JCV	47P		1
C69	PQCUV1H105JC	1	S	1
C70	ECUV1H330JCV	33P		1
C71	ECUV1H180JCV	18P		1
C72	PQCUV1E104MD	0.1		1
C73	PQCUV1H220JC	22P	S	1
C74	ECEA1HKS4R7	4.7	S	1
C75	ECUV1H030CCV	3P		1
C76	ECUV1H681JCV	680P		1

Ref. No.	Part No.	Value		Pcs/Set
C77	ECUV1H102KBV	0.001		1
C78	ECUV1H473MDV	0.047	S	1
C83	PQCUV1H102J	0.001	S	1
C84	ECUV1H102KB	0.001		1
C100	ECUV1H220JCV	22P		1
C101	ECUV1H220JCV	22P		1
C102	PQCUV1E224MD	0.22		1
C103~107	Not Used			
C108	PQCUV1E104MD	0.1		1
C110	ECKTAE103ZF	0.01	S	1
C111	ECKTAE103ZF	0.01	S	1
C112	ECEA1CK101	100	S	1
C113	ECUV1H104ZFV	0.1	S	1
C120	ECEA1CKS470	47	S	1
C121	PQCUV1H183MD	0.018		1
C122	ECUV1H332KBV	0.0033		1
C123	ECUV1H822KBV	0.0082		1
C124	ECKD2H681KB	680P	S	1
C125	ECKD2H681KB	680P	S	1
C126	ECQE2224KF	0.22		1
C130	ECEA0JU102	1000		1
C131	ECUV1C224ZFV	0.22		1
C132	Not Used			
C133	ECEA0JU102	1000		1
C134	ECEA1CU221	220		1
C135	ECEA1EU101	100	S	1
C136	PQCUV1H103KB	0.01	S	1
C137	PQCUV1E104MD	0.1		1
C138	PQCUV1H103KB	0.01	S	1
C139	PQCUV1E104MD	0.1		1
C160	ECEA1EU101	100	S	1
C161	PQCUV1H103KB	0.01	S	1
C162	ECEA1HKS2R2	2.2	S	1
C170	PQCUV1E104MD	0.1		1
C180	PQCUV1E104MD	0.1		1
C181	PQCUV1E223KB	0.022		1
C200	ECUV1H473MDV	0.047	S	1
C201	PQCUV1E104MD	0.1		1
C202	ECUV1H683ZFV	0.068	S	1
C203	ECUV1H473MDV	0.047	S	1
C204	Not Used			
C205	Not Used			
C206	ECUV1E105ZF	1	S	1
C207	ECUV1E105ZF	1	S	1
C208	ECEA1CKS470	47	S	1
C209	ECEA1HKS4R7	4.7	S	1
C210	PQCUV1C683MD	0.068		1
C211	PQCUV1E104MD	0.1		1
C212	PQCUV1H105JC	1	S	1
C213	ECEA1HU100	10	S	1
C214	PQCUV1H472KB	0.0047		1
C215	ECEA1HKS4R7	4.7	S	1
C216	ECEA1CKS470	47	S	1
C217	ECEA0JK221	220	S	1
C218	PQCUV1E104MD	0.1		1

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Ref. No.	Part No.	Value		Pcs/Set
C219	ECEA1HKS010	1	S	1
C220	ECEA1EU101	100	S	1
C221	ECEA1AU102	1000		1
C222	PQCUV1E104MD	0.1		1
C223	ECUV1H101JCV	100P		1
C224	PQCUV1H821JC	820P		1
C225	PQCUV1E333MD	0.033	S	1
C226	PQCUV1H183MD	0.018		1
C227	Not Used			
C228	ECUV1H682KBV	0.0068		1
C229	ECUV1H332KBV	0.0033		1
C230	PQCUV1E104MD	0.1		1
C231	ECUV1H100DCV	10P		1
C232	ECUV1H222J	0.0022	S	1
C233	ECUV1H221JCV	220P		1
C234	ECUV1H473MDV	0.047	S	1
C235	ECUV1H223KBV	0.022	S	1
C236	Not Used			
C237	ECUV1H101JCV	100P		1
C238	PQCUV1E104MD	0.1		1
C255	ECEA1CK101	100	S	1
C301	ECUV1H010CCV	1P		1
C302~304	Not Used			
C305	ECEA1CK101	100	S	1
C306	PQCUV1C334ZF	0.33		1
C307	ECUV1H104ZFV	0.1	S	1
C308	ECUV1H104ZFV	0.1	S	1
C309	ECUV1H104MD	0.1	S	1
C310	ECUV1H104ZFV	0.1	S	1
C311	ECUV1H104ZFV	0.1	S	1
C900	ECUV1H104ZFV	0.1	S	1
C901	ECUV1H330JCV	33P		1
C902	ECUV1H330JCV	33P		1
C903	ECUV1C224ZFV	0.22		1
C904	ECUV1H104ZFV	0.1	S	1
C905	PQCUV1H103KB	0.01	S	1
C906	PQCUV1E104MD	0.1		1
C907	EECW5R5D473	0.047	S	1

Ref. No.	Part No.	Part Name & Description		Pcs/Set
		OPERATION PRINTED CIRCUIT BOARD PARTS		
PCB2	PQWP2T4168CH	OPERATION, P.C.BOARD ASS'Y (RTL)		1
		(DIODES)		
D300~303	1SS131	DIODE(SI)	S	4
LED300	LN801LPDJA	LED		1
LED301	LN322GKGAH	LED		1
LED302	LN222RPH	LED		1
LED303	LN801LPDJA	LED		1
		(CONNECTOR)		
CNT2	PQJS14A36Z	CONNECTOR, 14 PIN		1
		(COILS)		
L300	PQLQZM100K	COIL	S	1
L301	PQLQZK1R5K	COIL		1
		(SWITCHES)		
S11	EVQQJJ05Q	SWITCH, DIALING "1"		1
S12	EVQQJJ05Q	SWITCH, DIALING "2"		1
S13	EVQQJJ05Q	SWITCH, DIALING "3"		1
S14	EVQQJJ05Q	SWITCH, DIALING "4"		1
S15	EVQQJJ05Q	SWITCH, DIALING "5"		1
S16	EVQQJJ05Q	SWITCH, DIALING "6"		1
S17	EVQQJJ05Q	SWITCH, DIALING "7"		1
S18	EVQQJJ05Q	SWITCH, DIALING "8"		1
S19	EVQQJJ05Q	SWITCH, DIALING "9"		1
S20	EVQQJJ05Q	SWITCH, DIALING "*"		1
S21	EVQQJJ05Q	SWITCH, DIALING "0"		1
S22	EVQQJJ05Q	SWITCH, DIALING "#"		1
S23	EVQQJJ05Q	SWITCH, SP-PHONE		1
S24	EVQQJJ05Q	SWITCH, MESSAGE		1
S25	EVQQJJ05Q	SWITCH, HOLD		1
S26	EVQQJJ05Q	SWITCH, LOCATOR/INTERCOM		1
S27	EVQQJJ05Q	SWITCH, SEARCH		1
S28	EVQQJJ05Q	SWITCH, SEARCH		1
S29	EVQQJJ05Q	SWITCH, FLASH		1
S30	EVQQJJ05Q	SWITCH, REDIAL/PAUSE		1
		(RESISTORS & CAPACITOR)		
R300	ERJ3GEYJ331	330		1
R301	ERJ3GEYJ331	330		1
R302	ERJ3GEYJ102	1K		1
R303	ERJ3GEYJ331	330		1
C300	ECUV1H104ZFV	0.1	S	1

This replacement parts list is Canada version only. Refer to the simplified manual(cover) for U.S.A. or other areas.

REPLACEMENT PARTS LIST

Model KX-T4168CR-B

Notes:

1. RTL (Retention Time Limited)
   The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. Important safety notice.
   Components identified by the ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The S mark indicates service standard parts and may differ from production parts.
4. RESISTORS & CAPACITORS
   Unless otherwise specified.
   All resistors are in ohms (Ω) K=1000Ω, M=1000KΩ
   All capacitors are in MICRO FARADS (μF) P= μμF
   *Type &Wattage of Resistor
   Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor
Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyester
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

Ref. No.	Part No.	Part Name & Description		Pcs
		CABINET AND ELECTRICAL PARTS		
100	PQKM10216Z2	FRONT CABINET		1
101	PQKF10146U2	CABINET COVER	S	1
102	PQSA10041Y	ANTENNA		1
103	PQAX3P16Z	SPEAKER		1
104	PQSX10035Z	12KEY SWITCH		1
105	PQKK10055Z2	DOOR-LID		1
106	PQXA36ASVC	RECHARGEABLE BATTERY		1
107	PQSX10033Z	COVER		1
108	PJHE5065Z	SCREW		2
109	PQBC10201Y	BUTTON, MESSAGE		1
110	PQGP10114Z1	LCD PANEL		1
111	PQGT12208Z	NAME PLATE		1

Ref. No.	Part No.	Part Name & Description		Pcs/Set
		MAIN P.C.BOARD PARTS		
PCB100	PQWPT4168CR	MAIN, P.C.BOARD ASS'Y (RTL)		1
		(ICS)		
IC1	PQVISC79159A	IC		1
IC2	AN6183SE1	IC		1
IC4	PQVISC78184D	IC		1
IC5	PQVI401714FU	IC		1
		(TRANSISTORS)		
Q 1	2SK543	TRANSISTOR(SI)		1
Q 2	2SC2295	TRANSISTOR(SI)	S	1
Q 3	2SC2412K	TRANSISTOR(SI)		1
Q 4	2SC2295	TRANSISTOR(SI)	S	1
Q 5	2SD1819A	TRANSISTOR(SI) [OR 2SC4155]		1
Q 6	2SD1819A	TRANSISTOR(SI) [OR 2SC4155]		1
Q101	XN1116	TRANSISTOR(SI)		1
Q200	2SD1819A	TRANSISTOR(SI) [OR 2SC4155]		1
Q201	2SD1819A	TRANSISTOR(SI) [OR 2SC4155]		1
Q202	2SB709A	TRANSISTOR(SI) [OR 2SA1162]	S	1
Q203	2SB709A	TRANSISTOR(SI) [OR 2SA1162]	S	1
Q210	2SD1819A	TRANSISTOR(SI) [OR 2SC4155]		1
Q220	2SB709A	TRANSISTOR(SI) [OR 2SA1162]	S	1
Q221	UN5113	TRANSISTOR(SI)		1
Q222	UN5113	TRANSISTOR(SI)		1
		(DIODES)		
D 1	MA840BTAKU	DIODE(SI)		1
D 3	PQVD1SV145	DIODE(SI)	S	1
D200	MA4068	DIODE(SI)	S	1
D201	1SS120	DIODE(SI)	S	1
D220	MA4068	DIODE(SI)	S	1
D221	MA700A	DIODE(SI)	S	1
D222	LNJ230RKRAC	LED		1
D223	LN01201CU3LF	LED	S	1
D224	LN01201CU3LF	LED	S	1
D225	LNJ330GKGAC	LED		1
D230	LN363GPPKU	LED		1
D231	LN363GPPKU	LED		1
D232	LN363GPPKU	LED		1
D233	LN363GPPKU	LED		1
D253	MA110	DIODE(SI)		1
		(COILS AND TRANSFORMERS)		
L1	ELJFAR68M	COIL	S	1
L2	PQLQZM1R5K	COIL	S	1
L4	PQLQZM100K	COIL	S	1
L200	PQLQZM100K	COIL	S	1
L201	PQLQZM100K	COIL	S	1
L202	PQLQZM100K	COIL	S	1

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Ref. No.	Part No.	Part Name & Description		Pcs/Set
T1	PQLA7M5	COIL		1
T2	PQLI2B201	I.F. TRANSFORMER		1
T3	PQL07A9	COIL		1
T11	PQLA7M6	COIL		1
T13	PQL07A8	COIL		1
		(CRYSTALS)		
X1	PQVCL3276N9Z	CRYSTAL OSCILLATOR		1
X2	PQVCJ3992N9Z	CRYSTAL OSCILLATOR		1
X3	PQVCJ10240C5	CRYSTAL OSCILLATOR		1
		(CERAMIC FILTERS)		
CF1	RVFSFE107MSR	CERAMIC FILTER	S	1
CF2	PQVFCFH455F1	CERAMIC FILTER		1
		(CONNECTORS)		
CN1	PQJP2D13Z	CONNECTOR, 2 PIN		1
CN2	PQJS15A68Y	CONNECTOR, 15 PIN		1
		(VARIABLE RESISTORS)		
VR1	EVNDXAA03B35	VARIABLE RESISTOR, 300KΩ		1
VR2	EVNDXAA03B35	VARIABLE RESISTOR, 300KΩ		1
VR101	EVNDXAA03B55	VARIABLE RESISTOR, 300KΩ		1
		(OTHERS)		
TC1	ECRLA030E53	TRIMMER CAPACITOR		1
LCD	PQAVLNY152G	LIQUID CRYSTAL DISPLAY		1
DUP1	ELB4Z003S	COIL	S	1
E101	PQEFBQM111G3	BUZZER	S	1
E102	PQJM124X	MICROPHONE		1
E103	PQHR10269Z	MIC COVER		1
E104	PQJT10101Z	BATTERY TERMINAL		1
E105	PQJT10102Z	BATTERY TERMINAL		2
E106	PQHR10451Z	LCD HOLDER		1

Ref. No.	Part No.	Value	Pcs/Set
		(RESISTORS)	
R 1	ERJ3GEYJ101	100	1
R 2	ERJ3GEYJ220	22	1
R 3	ERJ3GEYJ393	39K	1
R 4	ERJ3GEYJ470	47	1
R 5	ERJ3GEYJ470	47	1
R 6	ERJ3GEYJ154	150K	1
R 7	ERJ3GEYJ220	22	1
R 8	ERJ3GEYJ220	22	1
R 9	ERJ3GEYJ561	560	1
R10	ERJ3GEYJ223	22K	1
R11	ERJ3GEYJ393	39K	1
R12	ERJ3GEYJ562	5.6K	1
R13~16	Not Used		
R17	ERJ3GEYJ104	100K	1
R18	ERJ3GEYJ223	22K	1
R23	ERJ3GEYJ152	1.5K	1
R24	ERJ3GEYJ102	1K	1
R25	ERJ3GEYJ333	33K	1
R26	ERJ3GEYJ333	33K	1
R27	Not Used		
R28	ERJ3GEYJ222	2.2K	1
R29	ERJ3GEYJ334	330K	1
R30	ERJ3GEYJ154	150K	1
R31	ERJ3GEYJ474	470K	1
R32	ERJ3GEYJ564	560K	1
R33	ERJ3GEYJ562	5.6K	1
R34	ERJ3GEYJ823	82K	1
R35	ERJ3GEYJ224	220K	1
R36	ERJ3GEYJ104	100K	1
R37	ERJ3GEYJ274	270K	1
R38	Not Used		
R39	ERJ3GEYJ153	15K	1
R40	ERJ3GEYJ332	3.3K	1
R41	ERJ3GEYJ105	1M	1
R42	ERJ3GEYJ273	27K	1
R43	ERJ3GEYJ223	22K	1
R44	ERJ3GEYJ563	56K	1
R45	ERJ3GEYJ103	10K	1
R46	ERJ3GEYJ103	10K	1
R47	ERJ3GEYJ103	10K	1
R48	ERJ3GEYJ103	10K	1
R49	ERJ3GEYJ104	100K	1
R51	ERJ3GEYJ563	56K	1
R52	ERJ3GEYJ103	10K	1
R53	ERJ3GEYJ333	33K	1
R54	ERJ3GEYJ683	68K	1
R55	Not Used		
R56	Not Used		
R57	ERJ3GEYJ104	100K	1
R58	ERJ3GEYJ104	100K	1
R59	ERJ3GEYJ103	10K	1
R60	ERJ3GEYJ152	1.5K	1
R70	ERJ3GEYJ183	18K	1

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Ref. No.	Part No.	Value	Pcs/Set
R102	ERJ3GEYJ0R00	0	1
R202	ERJ3GEYJ562	5.6K	1
R203	ERJ3GEYJ392	3.9K	1
R204	ERJ3GEYJ104	100K	1
R205	ERJ3GEYJ120	12	1
R206	ERJ3GEYJ332	3.3K	1
R207	ERJ3GEYJ122	1.2K	1
R208	ERJ3GEYJ332	3.3K	1
R209	ERJ3GEYJ271	270	1
R210	ERJ3GEYJ334	330K	1
R211	ERJ3GEYJ334	330K	1
R212	PQ4R10XJ683	68K	1
R213	Not Used		
R214	Not Used		
R215	ERJ3GEYJ472	4.7K	1
R216	ERJ3GEYJ103	10K	1
R220	ERJ3GEYJ104	100K	1
R221	PQ4R10XJ681	680	1
R222	Not Used		
R223	ERJ3GEYJ391	390	1
R224	ERJ3GEYJ681	680	1
R225	ERJ3GEYJ0R00	0	1
R230	ERJ3GEYJ151	150	1
R231	ERJ3GEYJ151	150	1
R232	ERJ3GEYJ103	10K	1
R233	ERJ3GEYJ103	10K	1
R234	ERJ3GEYJ470	47	1
R235	ERJ3GEYJ152	1.5K	1
R236	ERJ3GEYJ473	47K	1
R237	ERJ3GEYJ104	100K	1
R238	ERJ3GEYJ106	10M	1
R239	ERJ3GEYJ106	10M	1
R240	ERJ3GEYJ472	4.7K	1
R241	ERJ3GEYJ472	4.7K	1
R242	ERJ3GEYJ472	4.7K	1
R243	ERJ3GEYJ224	220K	1
R601	ERJ3GEYJ332	3.3K	1
J1~3 J11 J109 J112~118 JP101	ERJ3GEYJ0R00	0	13

Ref. No.	Part No.	Value	Pcs/Set
		(CAPACITORS)	
C 1	ECUV1H103KBV	0.01 S	1
C 2	ECUV1H104ZFV	0.1 S	1
C 3	ECUV1H220JCV	22P	1
C 4	ECUV1H103KBV	0.01 S	1
C 5	ECUV1H151JCV	150P	1
C 6	ECUV1H220JCV	22P	1
C 7	ECUV1H103KBV	0.01 S	1
C 8	ECUV1H103KBV	0.01 S	1
C 9	ECUV1H100DCV	10P	1
C10	ECUV1H220JCV	22P	1
C11	ECUV1H103KBV	0.01 S	1
C12	ECUV1H470JCV	47P	1
C13	ECUV1H680JCV	68P	1
C14	ECUV1H330JCV	33P S	1
C15	ECUV1H150JCV	15P	1
C16	PQCUV1H180JC	18P S	1
C17	ECUV1H030CCV	3P	1
C18	ECUV1H102KBV	0.001	1
C19	ECUV1H223KBV	0.022 S	1
C20	ECUV1H120JCV	12P	1
C21	ECUV1H223KBV	0.022 S	1
C22	PQCUV1E104MD	0.1 S	1
C23	ECST1AX106	10	1
C24	ECUV1H103KBV	0.01 S	1
C25	PQCUV1C474ZF	0.47	1
C26	Not Used		
C27	ECUV1H103KBV	0.01 S	1
C28	ECUV1H103KBV	0.01	1
C29	ECUV1H104ZFV	0.1 S	1
C30	ECEA1AKS330	33 S	1
C31	PQCUV1C224ZF	0.22	1
C32	ECUV1H472KBV	0.0047	1
C33	ECUV1H104ZFV	0.1 S	1
C34	PQCUV1H105JC	1 S	1
C35	ECUV1H103KBV	0.01	1
C36	ECUV1H103KBV	0.01	1
C37	ECUV1H103KBV	0.01 S	1
C38	ECUV1H472KBV	0.0047	1
C39	ECUV1H330JCV	33P	1
C40	ECUV1H392KBV	0.0039	1
C41	ECUV1H104ZFV	0.1 S	1
C42	PQCUV1C334ZF	0.33	1
C43	ECUV1H104ZFV	0.1 S	1
C44	ECUV1H104ZFV	0.1 S	1
C45	ECUV1H104ZFV	0.1 S	1
C46	ECUV1H104ZFV	0.1 S	1
C47	ECUV1H104ZFV	0.1 S	1
C48	ECUV1H104ZFV	0.1 S	1
C49	PQCUV1H105JC	1 S	1
C50	ECUV1H104ZFV	0.1 S	1
C51	ECUV1H104ZFV	0.1 S	1
C52	ECUV1H392KBV	0.0039	1
C53	ECUV1H102KBV	0.001	1
C54	ECUV1H103KBV	0.01	1
C55	PQCUV1H105JC	1 S	1
C56	ECEA0GKS470	47	1
C60	ECUV1H220JCV	22P	1
C61	ECUV1H270JCV	27P	1

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Ref. No.	Part No.	Value		Pcs/Set
C62~66	Not Used			
C67	ECUV1H104ZFV	0.1	S	1
C70	ECUV1H104ZFV	0.1	S	1
C71	ECUV1H103KBV	0.01	S	1
C72	Not Used			
C73	Not Used			
C74	ECUV1H562MD	0.0056	S	1
C85	ECUV1H104ZFV	0.1	S	1
C202	ECUV1H103KBV	0.01	S	1
C203	ECUV1H103KBV	0.01	S	1
C215	ECUV1H103KBV	0.01	S	1
C216	ECUV1H103KBV	0.01		1
C220	ECUV1H104ZFV	0.1	S	1
C221	ECEA0GKS221	220		1
C222	PQCUV1E104MD	0.1	S	1
C223	ECUV1H103KBV	0.01	S	1
C224	ECUV1H180JCV	18P		1
C225	ECUV1H180JCV	18P		1
C226	ECUV1H120JCV	12P		1
C227	ECUV1H120JCV	12P		1
C230	ECUV1H104ZFV	0.1	S	1
C231	ECUV1H104ZFV	0.1	S	1
C232	ECST1AX106	10		1
C233	ECST1AX106	10		1
C234	ECUV1H104ZFV	0.1	S	1
C240	PQCUV1H105JC	1	S	1
C241	ECUV1H104ZFV	0.1	S	1
C242	ECUV1H223KBV	0.022	S	1
C600	ECUV1H104ZFV	0.1	S	1

Ref. No.	Part No.	Part Name & Description	Pcs/Set
		FIXTURE AND TOOL	
Z1	PQZZ14K8Z	EXTENSION CORD, 14 PIN	1

Note:
1. PQZZ14K8Z is useful for servicing.
(They make servicing easy.)

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Ref. No.	Part No.	Part Name & Description		Pcs/Set
		ACCESSORIES AND PACKING MATERIALS		
A1	PQJA59V	TEL CORD	S	1 ⚠
A2	KX-A11-6	AC ADAPTOR	S	1 ⚠
A3	PQQW11430Z	QUICK REFERENCE GUIDE (English)		1
A4	PQQW11600Z	QUICK REFERENCE GUIDE (French)		1
A5	PQQX11468Z	INSTRUCTION BOOK (English)		1
A6	PQQX11469Z	INSTRUCTION BOOK (French)		1
A7	PQKL24Y0	STAND		1
P1	PQPH89Y	PROTECTION COVER (for Base Unit)		1
P2	PQPP10072Z	PROTECTION COVER (for Portable Handset)		1
P3	PQPN10474Z	CUSHION		1
P4	PQPK11834Z	GIFT BOX		1